DRAGON USER

The independent Dragon magazine

60p May 1983 Volume 1 Number 1

New Frontiers: Data files, Get and Put

Full software survey

BBC, Vic, Spectrum and Dragon comparison

[illegible] Alpha, [illegible]

Microdeal profile

WIN An Epson MX-80F/TIII printer and word processor

WINDOW ON ANOTHER WORLD
Salamander Software

Cruise through the deepest reaches of space in a life and death struggle to decide the fate of the galaxy Match wits with mighty mages in the final battle for supremacy of the planet Xarg Test your driving skills on the tracks at Monte Carlo and Monza Or just relax on a Sunday afternoon with a round or two at your local golf course

Salamander Software offers a wide range of games for the Dragon 32 and Tandy 32K microcomputers Whatever your age, whatever your taste, Salamander Software has the program for you! See us at the Midland Computer Fair, Birmingham April 28 30

> "Why can't all software come up to this standard?"
> — Computer & Video Games

Price List
Dragon Trek £9 95p Wizard War £7 95p Golf £7 95p Grand Prix £7 95p Vulcan Noughts & Crosses £7 95p Games Compendium D1 £7 95p

PLEASE ADD 50p P&P TO ALL ORDERS

Send SAE for full catalogue with details of new releases

Cheques or postal orders payable to
SALAMANDER SOFTWARE Dept D 27 Ditching Rise Brighton East Sussex BN1 4QL
Tel 0273 771942

Programmers wanted good royalties paid!

Treble clef babble

May 1983

Editor
GRAHAM CUNNINGHAM
(01-839 2449)

Software Editor
GRAHAM TAYLOR (01-839 2504)

News Editor
DAVID KELLY

Editorial Secretary
CAROLINE OWEN (01 930 3266)

Advertisement Manager
DAVID LAKE

Advertisement Executive
SIMON LANGSTON (01 930 3840)

Administration
THERESA LACY (01-930 3266)

Managing Editor
DUNCAN SCOT

Publishing Director
JENNY IRELAND

Dragon User Hobhouse Court 19 Whitcomb Street London WC2 7HF
Published by Sunshine Books Scot Press Ltd
Typesetting by Chesham Press Chesham, Bucks Printed by Eden Fisher Southend-on Sea
Distributed by S M Distribution London SW9 01 274 8611 Telex 261643

© Sunshine Books 1983

Subscriptions
UK £8 for 12 issues
Overseas £14 for 12 issues

How to submit articles

The quality of the material we can publish in *Dragon User* each month will to a very great extent, depend on the quality of the discoveries that you can make with your Dragon The Dragon 32 computer was launched on to the market with a powerful version of Basic but with very poor documentation

Every one of us who uses a Dragon will be able to discover new tricks and quirks almost every day To help other Dragon users keep up with the speed of the development each of us must assume that we made the discovery first — that means writing it down and passing it on to others

Articles which are submitted to *Dragon User* for publication should not be more than 3000 words long All submissions should be typed Please leave wide margins and a double space between each line Programs should whenever possible be computer printed on plain white paper and be accompanied by a tape of the program

We cannot guarantee to return every submitted article or program so please keep a copy If you want to have your program returned you must include a stamped, addressed envelope

We pay for articles according to the length and the quality — it is worth making that extra bit of effort

Contents

Letters 5
Advice on buying a cassette recorder and on saving programs (don't blame it all on the Dragon)

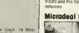
News 7
The Dragon is to get more memory and two new companions — one to battle with the BBC B the other with the IBM PC

Clubs 11
A personal account of the pleasures and pitfalls of setting up a users group

Software round-up 12
Who said there was no software for the Dragon? Not John Scriven who found packages that will push the machine to its limits once arcade games lose their thrill

In the red corner 16
Have you got the right machine? The Dragon takes on the BBC machines the Vic20 and the Spectrum Boris Allen referees

Micradeal talks 23



Graham Taylor went to Cornwall to talk to John Syme of software house Microdeal

Moonbase Alpha 26
See if you can land your shuttle on the hover pad at Moonbase Alpha

Command graphics 30
David Lawrence (featured on the front cover) introduces two of the most under-used commands in Dragon Basic GET and PUT

Data filing 34
How to save bodies of data on tape so that they can be used later avoiding the need to re-enter information manually each time a program is reloaded

Printerfacing 36
Making the most of your Dragon printer — from using the control codes to making a high resolution copy of the screen

Open File 39
We publish your programs this month versions of an old Chinese boardgame loading direct from the hex dump and the mysterious Dragonet

Dragon Answers 49
Increasing speed muddled joysticks using restore finding out about SAM — your questions answered

Competition Corner 50
Win a printer and meet Agog

Editorial

Welcome to *Dragon User* — Britain's first monthly magazine devoted entirely to helping owners of Dragon computers

It is nearly nine months since we first began to hear rumours that a little known toy company was about to launch a new home computer At the time Sinclair was having problems with his Spectrum computer but we still thought it unlikely that a newcomer with no experience of the market would be able to break in Then the Dragon 32 was launched in August It was undoubtedly a good and powerful machine We were still sceptical The documentation was poor and the parent toy company seemed to be in serious financial difficulties

Dragon Data's Managing Director Tony Clarke, has however managed to pull it off Various financial institutions bought and re-financed the company which enabled it to build up the production rate to come closer to meeting the unexpectedly high demand high street retailers and dealers accepted that the machine was going to prove popular and software houses began to include Dragon 32 material in their ranges

Dragon owners can now look forward to a long relationship with the company Work is being done to offer upgrades to the Basic and the memory of the Dragon 32 New more business orientated computers are being developed at the moment so that Dragon can offer a range of computers of different capacities at different prices so becoming less reliant on the possible vageries of one market

Versions of the Dragon 32 are now being sold in many parts of the world Later this summer a plant in the United States starts production for the American market On top of the 100 000 Dragons which will have been sold in Britain by Christmas we can look forward to the additional support of up to 200 000 Dragons in the US

All this means that Dragon owners can grow with their machines can bank on the support of any number of software and hardware companies which will in turn offer an ever growing range of add-ons and upgrades with which we can continually improve our machines

In *Dragon User* we will aim to keep you up to date with all the latest developments from Dragon, the latest software which we will test and rate and the latest hardware We will also with your help and discoveries learn how to make the most of the machine we already have

THE DRAGON DUNGEON

DRAGON GOODIES

Now that we've shifted the rack out of the torture chamber we've doubled our storage space and now stock the widest range of Dragon software available from a single UK source.

The Dungeon Master has been persuaded to expand his mingy little Price List and we can now send you a descriptive catalogue (with an outline of each program).

Best-selling books in stock Dragon Companion £4.95 The Working Dragon 32 £5.95 Dragon Extravaganza £4.95 Advanced BASIC for the Dragon £6.95

Best selling arcade games in stock Donkey King £8 Katerpillar Attack £8 Space Race £7.95 Planet Invasion £8

Best-selling adventures Pimania £10 Death's Head Hole £5.45 The Valley £11.45 Lionheart £5.45 Dragon Trek £9.95

Best-selling utilities Dragon Doodles and Demos £5 DASM Assembler Cartridge £19.95 Telewriter Full-facility WP system £49.95

DRAGON STICKS!

Top quality double potentiometer joysticks for the Dragon owner who demands arcade action. Ultra-sensitive, but tough and reliable, Dragon Sticks will keep on zapping when others fall! £19.95 per pair inclusive VAT and postage

DRAGON OWNERS CLUB

The Dragon Users Club at the Dungeon is the UK's largest (since our members hail from the Outer Orkneys to the Arabian Gulf and Zambia, should we say the **world's** largest?) The monthly club Newsletter Dragon's Teeth is packed with news, tips, reviews, programming advice, members adverts (free!), competitions, special offers and local User Group announcements. We have now introduced a 'Cousins' column to scan US developments in the 6809 field.

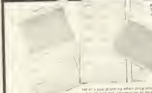
The May issue of Dragon's Teeth, due out on the first, includes hardware and software offers and the chance to win the first Dragon Data printer that comes into stock. Dragon Club badges, sweatshirts etc for extrovert Dragon bashers!

Annual membership including Dragon's Teeth £8 UK (£11 overseas) six month trial subscription £3.25 (£4.25 overseas)

THE DRAGON DUNGEON

PO BOX 4, ASHBOURNE, DERBYSHIRE DE6 1AQ. TEL. ASHBOURNE 44626

AT LAST! EFFECTIVE PROGRAMMING AIDS TO HELP YOU GET THE MOST FROM YOUR MICROCOMPUTER



PROGRAM DESIGN PADS (100 Sheets A3 – 11¾" x 16½") The use of this system will enable development of a structured approach to programming, a concept recommended by the BBC and other Educational Bodies. The sheets allow careful planning and storage of each program being designed and are cross referenced with each other when longer, more complicated programs are developed. They can be used as an immediate de-bugging guide when checking any newly coded program and will prove an invaluable tool for any micro programmer, whichever make of computer is being utilised.

GRAPHIC PLANNING PADS (100 Sheets A3 – 11¾" x 16½") The large size sheet allows the incorporation of an enlarged high resolution grid with the pixel coordinates numbered on all four axis to allow easier visual planning when programming graphics. Structured reference sections are clearly defined to enable all relevant information to be detailed on the same sheet, making it simple to refer to if problems are encountered when running the program. Pads are available for Spectrum, Dragon 32 and BBC.

GRAPHIC PLANNING GRIDS (100 Sheets A4 – 8¼" x 11¾") Each grid is designed for use with specified micro-computers and is a low cost aid to programmers wishing to develop their skills in designing high resolution graphic displays. Grids are marked on all four sides with pixel reference numbers appropriate to each computer for which they are available (Spectrum, Dragon 32 and BBC). An ideal aid to beginner and expert alike.

LOGIC-PLAN

PROGRAMMING AIDS FOR THE MICRO-COMPUTER
52 LIMBURY ROAD LUTON, BEDS LU3 2PL

LOGIC-PLAN PRODUCTS
0582 591493

Please supply –

___ PROGRAM DESIGN PADS @ £5.99
___ GRAPHIC PLANNING PADS @ £5.99
___ GRAPHIC PLANNING GRIDS @ £2.99
} including post/packing and V.A.T

My computer is a ________

I enclose cheque/P.O. for £ ________ *payable to LOGIC-PLAN*

NAME ________

ADDRESS ________

This is the chance to air your views — send your tips, compliments and complaints to Letters Page *Dragon User* Hobhouse Court, 19 Whitcomb Street, London WC2 7HF

Letters

Useful commands

THE FOLLOWING information about the use of *Pclear* may be of use to other Dragon users.

(1) When the Dragon's manual says *Pclear* behaves in a similar way to *Clear* they mean exactly the same way — all numeric and string stores are cleared and arrays un*Dimed*.

(2) The Dragon's manual also points out that "As each graphics page requires 1536 bytes of memory only reserve what is needed". Because the *Pclear* command's lowest number is 1, if your program uses no graphics at all you will waste 1536 bytes of memory ie *Page* 1.

It is possible to overcome the second problem. As Doug Dixon pointed out in P C W Vol 2 No 7 the start and end addresses of Basic are at Peeks 25 to 28. So instead of using *Pclear* use in direct mode *Poke* 25 6 to move the start address to 1537 and *Poke* 27 6 to move the end address two bytes to the right to 1539. Now to check this type

Print Peek (25) * 256 + *Peek* (26)

for the new start address and

Print Peek (27) * 256 + *Peek* (28)

for the new end address. Now you gain an extra 1.5K of memory.

An added advantage is that your program is protected. Try calling any graphics mode and your Dragon will not let you. As this new command is so useful why on earth was the Dragon's *Rom* not designed to allow *Pclear* 0?

Anthony Edwards
Amberley
Burkhamsted
Herts

Dragon fodder

A 10 YEAR OLD girl won a Dragon 32 for the school recently. It's a friendly Welsh Dragon. I would like to feed it on best anthracite and good educational programs. The former is easily found but the latter is non existent!

Could you through your magazine ask your readers to send me (or yourselves) details of cassettes, programs etc or at least the names of software houses specialising in Dragon fodder?

You see at the moment I feed the beast by hand and I don't like the glint in its celtic eye!

Save me!

Hywel Thomas (Head keeper)
Moorlands Junior, Bath

P S I'm sure lots of teachers will read your magazine so they would benefit from such information.

Word help needed

ENCLOSED WITH this letter is my first year's subscription to *Dragon User*.

One article which would be of great interest to me would be a Phonetic Dictionary for use with Computer Voice. Personally I have found great difficulty in constructing words. If an article is not possible for some reason then possibly ask readers to submit what words they have constructed and up date them each month.

J Gale
Wroughton
Swindon
Wilts

Storing problems . . .

PERHAPS I can help P A Low (*Popular Computing Weekly* 3-9 March 1983). I too had problems initially with storing programs from my Dragon on my cheap and nasty (£5.00) cassette recorder. I traced the problem to the cassette recorder motor taking too long to reach its running speed with the result that the first few bytes of the program header were corrupted when trying to *Csave* a program. The difficulty was completely overcome by always starting the cassette recorder manually before pressing *Enter*. There was no corresponding difficulty when *Cloading*.

The Dragon must have a delay built into its operating system to permit the cassette recorder to reach the correct speed before it begins to send data. In my case this delay is insufficient but presumably by *Poke*ing a suitable location it would be possible to increase this delay and ensure error free storage of data regardless of the cassette motor characteristics while still using the facility to control the cassette remotely. I would be grateful to hear of any suitable *Poke* values.

For my particular set up both *Csave*ing and *Cloading* are now totally reliable and trouble free. When typing a long program I always stop every ten minutes or so to save the work done so far. This ensures that if anything does go wrong the amount of effort wasted is kept to a minimum.

S J Beal
Addington
Croydon
Surrey

Solved once . . .

I TOO experienced considerable difficulty in loading and saving programs from a brand new Sanyo recorder purchased with my Dragon 32.

I discovered after many frustrating hours that the leads were very badly connected and after my husband had soldered the connections in the ear, mike and remote jacks for the cassette recorder it appeared my problems were over. A few months later the other end (which plugs into the computer) became disconnected and this too had to be soldered into position. Happily I now have no problems.

I do feel that this should not be happening and that these leads should be checked before leaving the factory. I now have a little trouble with the connection from the mains to the computer. The plastic was not in the clamp and was causing very bad connections.

M J Marley
Biscovey Par
Cornwall

Solved twice . . .

IF YOU are having *Save*ing problems first put a hand microphone or other source into the recorder to test that it does actually record.

By the bye, I would like to obtain the following but Tandy seem to have taken umbrage at the Dragon's use of the 6809 and are refusing to co-operate. Any suggestions?

(1) Colour Computer Technical Reference Manual (Tandy)
(2) Going Ahead With Extended Color Basic (Tandy)
(3) Basic Microprocessors and the 6800 (By Ron Bishop, Hayden Book Co Inc)

D L George
Shoreham by Sea
West Sussex

Recorder advice

SINCE BUYING a Dragon in December 1982 I have used four different makes of cassette recorder with it and found that the best results were obtained from a Binatone Radiocorder (£19.95 from Rumbelows). This is much more consistent than the Sony, Aiwa and Hitachi cassettes which I have also tried — this may be due to circuitry relating to Remote since some more expensive machines have delay mechanisms to prevent snatching at the tape (which can cause the tape to stretch).

However, even using the Binatone I can't get rid of all I-O errors and so the following is the procedure I follow when keying a program.

```
 10 Key program
 20 N=1
 30 Run program
 40 If error then debug error
    goto 30
 50 Poke 65494 0 (In case there
    was a Poke 65495 0 speed
    up routine in the program
 60 Press record on the cassette
 70 Csave  Program name
 80 Press rewind on the cassette
 90 Skipf  Program name
    (This is because Cload de-
    letes the existing program
    from store but Skipf
    doesn't)
100 If I-O error then rewind cas
    sette check playback
    volume if it was okay then
    N=N+1 goto 60 else
    change volume goto 90
110 The save is successful —
    switch everything off and go
    for N pints
```

The above procedure results in always having a reloadable program and so no keying effort is wasted.

F McCormack
Langley
Manchester

P S The highest volume I have had N reach is 3 — if it reaches a sufficiently high level to drive you towards alcoholism it may be better to change your cassette recorder.

DRAGON SOFTWARE

FOR ALL THE FAMILY

FAMILY PROGRAMS . . . £6.95

- Strategic tank battle for 2 players
- Educational maths quiz (3 levels)
- Guess the tune! (100 songs) 1 2 players
- Comprehensive mortgage savings calculator
- Massive 750 question Quiz for 1 2 players
- Simon type memory game
- Day-of week calculator
- Test your speed of reaction
- Chase the face across the screen
- Artists sketch pad
- Thread the ring through the wire 1-6 players

FUN AND GAMES . . . £6.95

- Hi-res noughts and crosses (2 levels)
- Brain teasing mastermind test
- Race against time to collect the gold
- Play card game Snap against the Dragon
- Unjumble the town name anagrams
- Pin the tail to the donkey!
- Who can score the highest at poker dice
- Pair up the colours / circles
- Create and compare your computer art
- Let the Dragon control your party games

LIVE AND LEARN . . . £6.95

- Step-by-step tutorial explaining the mysteries of High resolution graphics
- Facts and figures about favourite zoo animals with world map and a quiz
- Educational tour of England Scotland and Wales
- Instructional quiz on towns and cities of Britain
- How would you survive in a desert? Try the quiz then learn the facts
- Play your own tunes and learn about music notation

CITY DEFENCE . . . £5.75 . . exciting missile command arcade game for joystick With good sound colour and graphics

GENEROUS DEALER DISCOUNTS SEND NOW FOR OUR STARTER PACK OFFER

HEAR WHAT THEY HAD TO SAY:

Well-thought-out programs made better by professional presentation and full use of Dragon facilities Popular Computing Weekly

Excellent for children's parties Your Computer *(FUN AND GAMES)*

"Very enjoyable excellent quality CG of Colchester *(FAMILY PROGRAMS)*

- 48 HOUR DESPATCH BY 1ST CLASS POST
- LIFE-TIME REPLACEMENT GUARANTEE
- AUTOMATIC MEMBERSHIP OF SHARDS USER CLUB (with discounts and newsletter)

£11.95 FOR ANY 2 CASSETTES; £15.95 FOR 3; £18.95 FOR ALL 4 CASSETTES!!

SEND CHEQUES/POs
to
(Prices include P&P)

SHARDS SOFTWARE

At,
10 PARK VALE COURT
VINE WAY, BRENTWOOD
ESSEX CM14 4UR

AN INCREDIBLE EXPERIENCE FOR ADVENTUROUS DRAGON OWNERS . . . FROM WINTERSOFT

WINTERSOFT
THE RING OF DARKNESS

THE RING OF DARKNESS

The game created to be the most complex enthralling addictive and detailed adventure ever written for the Dragon 32. A whole graphic world (of nearly 3000 travel days) with kings princesses mad jesters and dangerous quests will unfold before you. Across ocean river mountain and forest you travel to trade in many places and dare the depths of vast dungeons (more than 3 levels deep with over 20 different creatures in hi res 3-D graphics) in search of fortune and the hidden curse of the Dark Ring. Many hours of mystery suspense and raw excitement await you.

"The most impressive adventure tested . . . soon displaced breakfast TV in our house" *Your Computer (April)* £19.90

AND FOR REALLY HUNGRY DRAGONS

Pepper's Game Pack (8 Great Games)	£7.95
Dragon Trek excellent value for money . . . the title sequence was magnificent *Your Computer*	£9.99
Artist & Designer (high resolution utilities)	£8.99

All prices include p&p VAT and the wintersoft guarantee of quality and reliability

Available from good software outlets or send cheques/PO to

S. W. WINTER & Co. Ltd.
101 Westminster Bridge Road
London SE1 7HR
Tel 01-928 5945 01-633 9611

TELEWRITER™

the DRAGON 32 Word Processor

51 column × 24 line screen display
Sophisticated full screen editor
Real [illegible] actions
Powerful [illegible] formatter
Works with any printer
Speed [illegible]
Requires absolutely no hardware modifications
A Tandy colour version also available

51 × 24 DISPLAY

FULL SCREEN EDITOR

FORMAT FEATURES

CASSETTE INPUT OUTPUT

AVAILABLE FROM DRAGON 32 DEALERS NATIONWIDE
OR DIRECT FROM
MICRODEAL
41 TRURO ROAD
ST. AUSTELL
CORNWALL
PL25 5JE
24 HOUR ORDERLINE
0726 67676

SEND 1stCLASS STAMP FOR OUR FREE SOFTWARE LISTS FOR DRAGON 32 & TANDY RANGE OF COMPUTERS

PLEASE STATE WHICH COMPUTER YOU OWN

No Dragons at Smiths

W H SMITHS has no plans to stock either the Dragon 32 or software to run on it

It seems both Smiths and Dragon are too busy to consider it

Smiths John Roland commented What with the Spectrum Commodore 64 and Oric we have enough on our plate already

Dragon s Richard Wadman said They are interested but at the moment we haven t got the capacity I think it would be unfair to take on an additional retailer the size of Smiths at this time

Also since Boots already stocks the machine it is not in Dragon s interest to have two high street stores competing on price

More micros to follow memory

HAVING sold over 50 000 Dragon 32 machines Dragon Data plans a formidable hardware expansion in 1983

First come the discs planned for the end of April A single-disc system with interface and disc operating system will cost £275

The package uses a half height 5¼ inch single-sided single-density 48 tracks per inch drive with a capacity of 180K formatted (¼M unformatted)

Dragon Data is also licensing the OS9 disc operating system (around £40) and Basic 09 Pascal and Version 7C compilers (all around £40) from Microware in the US

These will be available in the middle of May at the same time as the expansion box giving the Dragon 64K Ram This add on may include twin RS232 interfaces (not finalised) but should cost around £30

An 80-column card (monochrome only) is in the final stages of development and should be out soon

Software to run the extensive range of business packages available under CIS Cobol is also planned — to work with programs under 30K in size

Dragon Data also plans two completely new machines for launch later in the year

The first will sell for around £400 and be a competitor for the BBC Model B the second will be a full blown business system aimed at the IBM PC Sirius market

New factory opens

Production will reach 10 000 Dragons a week

PRODUCTION of Dragon computers is to be stepped up now that the move to new premises is complete

The new factory at Kenfig near Port Talbot has a much increased manufacturing capacity compared with the old site within Mettoy

Dragon is now manufacturing just under 5 000 machines a week

'The move went very smoothly and over the next couple of months we shall be stepping up our production to 10 000 units a week commented Dragon s Tony Clarke

However it will take some time for production to exceed demand

Dragon 32 machines were in very short supply immediately prior to Christmas and all of Dragon s outlets — including the Boots stores — are still receiving a restricted allocation

Always when you get a great many orders there is a temptation to throw everything you can out of the door countered Clarke But that is counter productive

All our machines are soak-tested and we have had to adopt a strict allocation system for all of the Dragon s customers

Trojan lets out light

TROJAN Products is now selling a light pen for the Dragon

The unit costs £10 and is supplied complete with a cassette giving full instructions and examples showing how to incorporate the input from the pen into a program

The light pen plugs into the joystick port on the Dragon and is addressable from the keyboard

It can be used to input x-y co ordinate data from the screen and is also fast enough in reaction to be used in certain types of games

Just plug into the joystick port

More information from Trojan Products 166 Derlwyn Dunvant Swansea

Users get options on assemblers

SUDDENLY there is a reasonable choice of assemblers available for the Dragon

Dragon itself has two versions on the way — one on cassette and one in Rom Other packages are available from Compusense and J Morrison (Micros)

The two Dragon Data offerings are assembler/editors with a de bug facility The cassette-based version priced at around £10 is the simpler

The cartridge version will follow soon with more extensive de bug capabilities and will be priced around £40

Compusense s assembler is a different sort of package — it is what is called an in line assembler Rather than being Rom independent the cartridge does not interrupt the Basic

Instead it adds extra commands which allow the assembly language to be added to an existing Basic program When the assembler cartridge is then executed it runs through the Basic program picking out and compiling the code

The beauty of the package explained a Compusense spokesman is that the code is embedded in the Basic That way there is no need for an editor — the editor is already there in the Basic

The Compusense DASM assembler is available from PO Box 169 Palmers Green London N13 price £18 95

Finally there is the editor assembler from J Morrison (Micros) Converted from a 6809 system developed for the SW Tech machine this is a two-pass assembler which functions independently of the Dragon s Rom

The package includes error notification (14 codes) and a machine code monitor It is supplied in cassette form and costs £27 65 More details from J Morrison (Micros) 2 Glensdale Street Leeds

Dragon 32 goes west

Dragon Data s Tony Clarke

THE DRAGON 32 machine will be launched in the US this year

Three American companies are currently in discussion with Dragon Data with a view to manufacturing the machine in the US

Nothing has been finalised yet said Dragon managing director Tony Clarke Whatever happens it will be manufactured over there for economic reasons as a joint venture with a US company

Decode for Tandy tapes

TAPE software written for the Tandy Colour Computer can be loaded directly into the Dragon 32 using a new cartridge from Compusense

Both machines run the same version of Microsoft Basic and have similar hardware This means that a program keyed directly into either machine will run

However because of differences in the input/output routines when a Tandy program is loaded into the Dragon from tape certain of the Basic keywords are misinterpreted

Within the machine each keyword — such as *Gosub* or *List* — is represented by what is called a token The problem of software compatibility is that in some cases the same token is used to represent different keywords on the different machines

The Compusense Decode cartridge simply goes through the Tandy program after it is loaded and makes the necessary corrections to the tokens so that it will run properly

First the Decode cartridge is plugged into the Dragon Normally this would interrupt the keyboard input but the Decode pin connector has been specially adapted so that this does not happen

Then the Tandy program required for conversion is loaded from tape in the normal manner

Finally the Decode program is run by typing in the command EXEC &HC000

When the translation is complete the program now in Dragon 32 format can be saved to tape

The cartridge will successfully convert almost any program written for the Tandy Colour computer in Extended Microsoft Basic The Decode program has been designed so that it ignores the content of strings

Machine-code held in subroutines — used to set up the graphics for example — is not affected by the Decode program Machine-code routines will work equally on both machines without an adaptation

The only possible problem could come if someone has used part of the Tandy Rom in a program without using one of the standard machine-code entry points explained Compusense s Ted Opyrchal But in practice professional software houses tend not to access the Tandy Rom

We originally developed the Decode program for ourselves and we still use it on a commercial basis

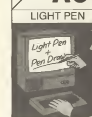
Decode costs £18 95 and is available from Compusense PO Box 169 Palmers Green London N13

ADI

ACCORD DATA

ADI

LIGHT PEN



PEN DRAW

- ★ A LIGHT PEN AND PEN DRAW PROGRAM FOR ONLY **£9.45**
- ★ DRAW PICTURES DIRECTLY ON TO YOUR TV SCREEN
- ★ STORE UP TO EIGHT PICTURES IN COMPUTER MEMORY
- ★ EDIT PICTURES
- ★ VIEW PICTURES IN HIGH OR LOW RESOLUTION GRAPHICS
- ★ SAVE PICTURES ON TO CASSETTE
- ★ LOAD PICTURES FROM CASSETTE
- ★ PROGRAM WRITTEN IN BASIC WITH REM STATEMENTS TO HELP YOU DEVELOP YOUR OWN PEN PROGRAMS
- ★ PROGRAM CONTAINS FULLY COMPREHENSIVE OPERATING INSTRUCTIONS

ADI

Please send cheques or postal orders (made payable to Accord Data Ltd) to Accord Data Ltd, Church Street, Great Budworth, Cheshire

ADI

News Desk

01-839 2449

BRIGHTON based software house Salamander has announced three new titles for the Dragon These are Starfighter a machine-code arcade type game Super Hangman featuring high resolution graphics and a 1 000-word vocabulary and Sketchpad a graphics package More details from Salamander 17 Norfolk Road Brighton

Package additions on the way

IN THE next two months Dragon will launch a substantial catalogue of new software titles

We are just finalising agreements for 20 new programs said Dragon s software development manager Pam Bolitha.

First comes Rail Runner a Frogger type game followed by El Diablero an adventure game set in the desert Whirly bird Run and Shark Treasure

Computer Voice is a speech synthesiser using string arrays to build up phonetic codes These can be used like building blocks to make up simple sentences which can be incorporated into programs

Dragon also plans a series of 10 educational programs aimed at the 4–12 age range The first two titles in this Young Learning Series — dealing with numeracy and literacy — will be available very soon Four more titles in the series are on the way

Tandy UK puts Dragon at ease

TANDY has denied claims that it is planning legal action against Dragon Data because of the similarity of the Dragon 32 to the Tandy Colour Computer

We have absolutely no objection to the Dragon machine said Tandy s UK managing director John Sayers "We do not have any copyright on our computer in the UK

It is true that the two machines are similar in a lot of respects — they use the same or very similar Rom pack for example — but I can tell you categorically that we are not planning any legal action

Besides by the time these things are settled out of court the machine is often out of date " he added

Because both machines license the same version of Microsoft Basic and use the same processor some software for the Tandy is directly applicable to the Dragon

Increasingly British software houses are looking to the US for Tandy material which can be easily converted for the Dragon For example Microdeal is selling material by Tom Mix originally developed for the Tandy The same is true of Compusense

Ted Opyrchal of Compusense commented 'Increasingly the market is moving to produce standard software for the two machines"

FOR A LOT OF FUN ON YOUR DRAGON JOIN OUR CLUB

Members program listings competitions special offers jokes and snippets of news and comments

We have a vast selection of games utility and business software Over 100 titles currently in stock!

THE STATACOM TOP 10

Donkey King (Microdeal)
Planet Invasion (Microdeal)
Talewriter (Microdeal)
Strategic Command (Romik)
Warlord (Lothlorian)
Wizard War (Salamander)
Golf (Salamander)
Pimania (Automata)
Chess (Dragon Data)
Banking Bank Rec (Hilton)

Also DEMON DASM and DECODE from Compusense

NEW TITLES Cosmic Zap Galactic Ambush Talking Android Attack Ring Of Darkness and more on the way!

PRINTERS Oki Microlines a speciality also Epsons & Seikoshas

MONITORS Primatel s Luxor colour monitor/TV (14")

ACCESSORIES Printer/monitor cables dust covers and The Plug

AMERICAN EXPRESS

DINERS CLUB

STATACOM LIMITED
234 HIGH STREET,
SUTTON, SURREY SM1 1NX

Telephone/Mail Orders welcome

BUFFER MICRO LTD
310 STREATHAM HIGH ROAD, LONDON SW16 6HG
Tel 01-769 2887

Open Tuesday—Saturday 10 30 am to 5 30 pm (Closed Mondays)

SOFTWARE FROM ALL THE BEST SUPPLIERS — OVER THE COUNTER — PLUS GROWING RANGE OF PERIPHERALS SEE IT BEFORE YOU BUY IT.

SAE appreciated for catalogue — but please specify for which computer

DRAGON ZX81 ZX SPECTRUM

THE DRAGON'S LAIR
New DRAGON SOFTWARE COUNTER just opened
Software demonstrations every day

BBC-ACORN KEYBOARDS ADD-ONS CASSETTES BOOKS VIC20

NEW! – BUFFER CLUB for regular customers Special Offers – Lectures – Foreign Trips – Software Promotions Ask for details of membership on your next visit

MEMBER OF THE COMPUTER TRADE ASSOCIATION — YOUR FAIR DEAL GUARANTEE

VISA — ACCESS — AMERICAN EXPRESS — DINERS CLUB CARDS WELCOME

PROGRAM DIRECT

DRAGON

SOFTWARE

SUBMARINE COMMAND

Take a modern Nuclear Sub[illegible] patrol across the Atlantic. Stalk the enemy's convoys and sink his ship – but beware – enemy warships will be hunting you!

Great new game especially written for **Dragon** with full colour graphics in Machine Code **£7.95 (inc.)**

FEATURES INCLUDE

- Animated map and sonar screen
- View the enemy through the periscope
- Conventional and homing torpedoes
- Surface–surface missiles
- The enemy uses surface warships and aircrafts against you
- Full status report
- Full easy to understand instruction sheet

DRAGON GAMES PACK

LUNAR LANDER o BOMBER o BREAKOUT All in one cassette

Exciting and addictive **£5.95 (inc.)**

MASTER CARDS PLAYER

Sophisticated implementations of two of the most popular card games **POKER** and **PONTOON**

Each program uses high resolution colour graphics
Bluff or be bluffed **£6.95 (inc.)**

GREAT NEW GAMES FOR YOUR DRAGON 32 COMPUTER

OUR GUARANTEE

If our product ever fails to load simply return it within 14 days and we will immediately replace it with refund for the postage

All prices include VAT Postage & Packing

Send Cheques / P.O. made payable to

PROGRAM DIRECT LIMITED
37B NEW CAVENDISH STREET
LONDON W1M 8JR

DEALERS ENQUIRIES WELCOME

Please send me the following software immediately

☐	**Submarine Command**	£7.95 inc
☐	**Master Cards Player**	£6.95 inc.
☐	**Dragon Games Pack**	£5.95 inc

I enclose a Cheque / P.O. for £

NAME

ADDRESS

Postcode

Each month we write about one particular club — if you think youre should be featured here write to Clubs Page *Dragon User* Hobhouse Court, 19 Whitcomb Street London WC2 7HF

Doug Bourne (left) and Dave Windle (right)

Two-man band in full flow

***Dave Windle** gives a personal account of the pleasures and problems of setting up a users group*

YOU WOULD THINK that being on the committee of two local camera clubs as well as having a full-time job that involves two or three evenings a week plus doing an evening class in computer programming would be enough for anyone However when I first approached Doug Bourne with the germ of an idea about starting a Dragon users group he was immediately keen As a local magistrate I also have plenty to occupy my time so the decision to form the Dragon Independent Owners Association was not taken lightly

Part of our enthusiasm came from Dragon Data s slowness As you are frantically unpacking your brand new Dragon impatient to connect it to your television and perform miracles of programming a small white card flutters to the floor A few hours later realising that you really do need to read that manual you sit back to take stock and come across that card again

Part of the card is the usual guarantee Another part invites the new owner to fill in the printed form and become a member of the Dragon Data Club Dragon s own user group Unfortunately at the time of writing that is the last you will hear of the club

How many brand new compulsists sitting gazing at a faulty listing have wished that there was someone they could turn to? Of course many hardware retailers are very good They must be very patient hearing over and over again the same problems which customers find as they unravel the mysteries of whichever machine they are the proud owner of

So it was in the light of thoughts such as these that the DIOA was conceived We first considered a local group A quick survey of two schools (to which we have access) turned up a dozen or so ZX81s three or four Spectrums an odd Vic or two and just three Dragons On the face of it therefore a local group was a non starter So we decided to take the plunge and began making enquiries to try to gauge the interest both among owners and within the mushrooming software industry

A first tentative advertisement brought around 60 requests for information Within two weeks this had risen to well over 100 so we felt that the need was there Many of these requests were accompanied by long letters detailing snags that owners had come up against mostly with tape recorders and many complaining about the Dragon manual

The next step was to contact software houses as we felt that we should offer members more than just a shoulder to cry on The response to our requests for a discount for members was amazing Within a few days we received not only many letters offering discounted software but also copies of the software for us to evaluate and eventually review in our newsletters

A visit to the bank furnished us with much needed financial advice Though of course banks cannot lend money to start an association such as ours the manager was most helpful in pointing out some of the pitfalls strewn across our path

The next problem as one enquirer pointed out, was one of politics He was not sure about the ethics of a group run by two people rather than by a committee of members This is of course a very valid point. However it is a chicken and egg situation — how do you form a committee without having any members in the first place? We decided therefore that we would take it upon ourselves to make the decisions and initially at least finance the venture

We felt justified in risking a few pounds on further advertising for members Our first shock came with the first professionally printed work that we had done Having designed them ourselves we were surprised at the bill for our information sheets which was more than double the expected amount It meant that other plans we had for good quality graphic pads and flashy membership cards would have to wait

It also meant that our newsletter would have to be duplicated rather than printed However we hoped members would be more interested in what we could actually do for them than how showy we were and in fact this seems to be the case Our newsletter *The Dragon s Tale* is as yet only one issue old The first edition was of necessity quite skimpy A short editorial a few reviews some details of our discount scheme and a list of software houses filled (almost) the four pages

We were pleasantly surprised at the reaction of members who wrote and congratulated us on the newsletter This was followed by a letter from one of the software houses involved in our scheme which also was most encouraging

To be absolutely honest we were disappointed that after the rush of enquiries the numbers joining us trickled rather than gushed in but that trickle thankfully continues On reflection how we would have coped with say 200 members overnight is difficult to imagine As things have worked out we now have a workable system set up and most enquiries are dealt with within two or three days New members should get a letter of receipt of subscription within the same period of time

Eventually we hope that it will be possible to form a committee as referred to earlier The problems of doing so still loom large — the biggest of these being that members live all over the country and in one case overseas So at present the workload is split between Doug and myself

Doug is our PR man and also our supplies officer He was unbearable when he received a large envelope recently addressed to The Marketing Director He also has the task of contacting software houses and is responsible for keeping the peace when we step on somebody s toes Once full of enthusiasm we failed to read properly a reply from one of the biggest software houses and involved it in our voucher scheme — which was not quite what it had agreed to However to its credit the firm was very fair with us and in fact under a different arrangement has offered our members a larger discount than before

My job or jobs are those of membership secretary and editor of the newsletter I must admit that I am finding it most enjoyable sifting through the letters as well as very informative

The first newsletter was a bit of a one-man band as far as contents go but I am sure that this is going to change With subsequent issues the aim is to get our members to use *The Dragon s Tale* as a discussion platform and in my mind at least it is the most important aspect of our fledgling group

Already the letters we have received show that out there in micro land are some very active and bright minds

We hope the Dragon Independent Owners Association will be able to do a lot more for the Dragon owner We have to accept that we must learn to walk before we run The days when anyone who had anything to do with computers was an electronics wizard are gone Many of us ordinary but interested people now make up the majority of owners We all need help however far advanced we are in our new hobby and that is why the DIAO was started to try to help other Dragon owners by sharing knowledge and information and by providing a platform for discussion on the many aspects of taming the Dragon

Further details of the group can be obtained by sending a self-addressed (stamped) envelope to DIOA, School House, Nevern Road Rayleigh Essex

Software round-up

*Fighting Samurai and spaceships, manipulating databases and synthesising speech – **John Scriven** finds software that will push the Dragon to its limits once arcade games have lost their thrill*

WHEN THE DRAGON appeared last summer it was encouraging to see that Dragon Data was launching software at the same time All too often manufacturers produce good hardware but neglect the software side forgetting that machines that are sold with games potential will not be bought unless the games are available

Indeed computers sell to a large degree on the software support available Since those early days many more programs have become available and it is interesting to see what progress has been made since then

Software for the Dragon is available in two forms — Rom cartridges that plug into the side and cassettes that have to be loaded via a cassette player The material available on cartridge consists mainly of arcade type games As they are written in machine code they are fast and some incorporate modifications that make them more fun than the originals

When you purchase any software check up to see if you need joysticks The packaging does not always make this clear and they are often essential There are several models on the market of varying quality and price so if you have not yet acquired a set it is wise to shop around

Drsgon's own

First of all the Dragon Data cartridges Meteoroids is a version of Asteroids with a few advantages over similar games It is possible to select the skill level from 0 to 15 It is also possible to use 1 2 or even no joysticks Controlling the errant spacecraft is fairly difficult until you realise that Newton s Laws on gravity are obeyed rather well and take this into account. Once you learn to cope with this it is a lot of fun

The object is to destroy as many meteoroids as possible before you fall foul of the flying saucers which are too accurate for comfort Individual and best scores are shown in a league table Unfortunately the display is in black and white in order to use the highest resolution but this is inherent in the machine and a problem that occurs in many games

Cosmic Invaders is a rather weak version of the old favourite Space Invaders and is somewhat lacking in sparkle Anyone who has played the original would soon tire of this cartridge It is fairly easy to master and once you discover how to beat it even the prospect of a high score fails to excite

Starship Chameleon can be played by one or two players and involves destroying enemy rockets by colliding your own craft with them The interesting difference is that craft are colour-coded according to whether they are made of matter or antimatter If your craft has the wrong matter status (selected with the fire button on the joystick) then you will explode Red missiles that are smart ie home in on you, add to the challenge of the game Skill levels from 1 to 9 may be selected and the scores are shown on the screen

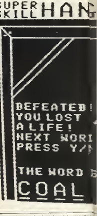
My one criticism of this game is that the background colour is the emetic green that Dragons produce and with all the high-speed movement on screen you could end up the same colour On a more serious level this is more original than Cosmic Invaders and to my mind offers much more of a challenge

There are two cartridges that involve chasing round mazes although Dragon Data has avoided calling either of them Taff men

Cave Hunters presents you with a cave maze always the same, with four bars of gold at the base The intrepid pot holer has to collect them one at a time and deposit them just outside the entrance Nothing could be that simple however — lurking in the cave are unpleasant creatures who devour you when they catch up with you unless you ve recently passed over a power pack, when you have a few seconds to turn the tables on them This game is fast-moving entertaining and more difficult than it at first appears

Ghost Attack is rather more familiar in design The object here is to gobble up proton pills littering a maze while avoiding the attentions of three ghosts (unless you ve recently passed over an energiser) There are three levels of difficulty — easy hard and tuff This game is fun to play but for some undisclosed reason is more expensive than the other cartridges

Berserk the last of the Dragon Data cartridges is based on a popular arcade game that is not often translated to the home computer format This is another game where colour has had to be sacrificed for high resolution You control a small man who must be steered through a series of inter-connecting rooms Robots inhabit the maze and you have to shoot them before they zap you The walls are electrified as are the robots so steady hands are necessary



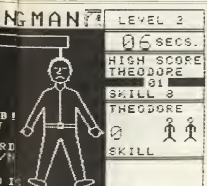
```
SUPER
SKILL HAN
DEFEATED!
YOU LOST
A LIFE!
NEXT WORI
PRESS Y/
THE WORD
COAL
```

His life in your hands – a timer ticks away the la

As you move off the edge of the screen another series of rooms appears It is important to resist the attentions of a lethal bouncing ball called Evil Orville He cannot be destroyed and tends to move faster than you can This is a well-written game and makes good use of the graphics of the Dragon

The cassettes from Dragon Data cover a wide range of activities and demonstrate the many possible uses for a home computer when arcade games lose their thrill They are considerably cheaper than cartridges but naturally take much longer to load and leave you at the mercy of a sometimes unkind cassette operating system If you ve used your Dragon for some time then you ve probably discovered that once the correct level has been set you have no trouble with your own cassettes but those recorded on other machines can be temperamental

Special Selection 1 contains four simple games that tax the parts that arcade games do not reach namely memory and intellectual skills rather than well co ordinated hand eye movements Brain selects two characters from the keyboard



the test

seconds as you try to win a reprieve

and gives you clues as you attempt to guess them. Four is a version of Connect Four, which is itself a larger version of noughts and crosses. Horse is a gambling game (in which the computer cheats — I'm sure it does!). Simon is the familiar colour/sound memory game. This tape is good value and even invites you to list the programs in order to discover how the various effects are achieved, so can be used to learn more about the workings of your Dragon.

Graphic Animator uses joysticks to design shapes and pictures on the screen. There is an option to save several pages of graphics and to flick them through quickly to produce an animated effect. This is an interesting cassette, but needs practice to control the movements.

Personal Finance contains three home management programs: Family Budget, Family Accounts and Family Address. The names are self-explanatory, and the programs utilise the excellent file handling capabilities of the Dragon. Once the main program is in memory, different files can be selected, sorted, changed, deleted etc, and the new version stored for later use. The documentation, as with all Dragon Data software, is clear and well written, and the tape is good value if you want to exploit the serious side of your Dragon.

Special Selection 2 also uses the file system to manipulate a database. This program is better than some costing twice as much — even without considering the other programs. It allows you to set up your own database and to put the entries in order, not just in the first field, but in all the others. This means that if you used the system to store names, addresses and telephone numbers, you could sort the file into alphabetical order of names or addresses, or even in the order of the phone numbers.

Of the other programs, Music uses the screen as a sheet of manuscript upon which notes may be written. The tune can be played after completion and stored on tape if you fancy your chances with a new Eurovision song winner. The version of Hangman is extremely feeble — drawing a large Dragon is no substitute for the gallows!

Compulsvoice is very good value. It allows you to output speech from your television. This has to be entered carefully using phonemes or sound blocks. If you enter the words as they are spelt, the result is awful, but if you experiment with the instruction book in hand, it is quite simple to make your Dragon offer a friendly word of advice during a game. Longer phrases are possible, but I confess it was two days' work before it said "Brain the size of a planet and I end up here!" The quality could not be considered anything more than rudimentary, but as an introduction to speech synthesis is has to be good value.

Quest is a cross between Adventure and Kingdom. The aim is simple — to traverse a patch of unpleasant country and invade Moorlock's Citadel. Achieving this aim is considerably more difficult. You need to equip yourself at various markets with men and tools as your progress is slowly revealed on a map of the terrain. My verdict is entertaining — but difficult.

Madness and the Minotaur is in the mould of traditional text adventures. The challenge is to seek treasure in a labyrinth of passages and bring it to the surface. Inhabiting the many rooms are both friendly and unfriendly creatures. Exploring the many locations and learning the different spells is a time-consuming business, but if you enjoy this sort of game, you will not be disappointed with this version.

To the limits

There are now many firms apart from Dragon itself which are offering software. In some cases it is not of a particularly high standard — in others it pushes the Dragon almost to its limits. There appear to be more cassettes on the market than cartridges, so that is where I shall concentrate.

Games Compendium from Salamander Software contains six games. Donkey Derby is similar in concept to Horse on a previous Dragon Data cassette, but has more entertaining graphics. If your steed falls, it lies there with its feet in the air! The game also allowed me to win much more than in real life. The second game, Kingdom, is a management simulation of ruling a country. I did not get on as well as on the BBC demonstration tape version, but this probably says more about my skill in governing than the quality of the program.

Blackjack is the American form of Pontoon, a card game where you try to get a hand worth 21 points. The graphics are reasonable, and the game seems fair, as I didn't feel the computer cheated all the time! Hunt the Wumpus is such an old computer game it probably has its origins in valve-driven mainframes. You need to explore a cave system seeking this strange animal, the Wumpus. The computer will tell you if you are getting close and you may fire crooked arrows into the cavern that is his lair. If it's the wrong cave, you may get the arrow on the rebound; if you stumble into his cave, you are eaten — with mustard! Not as addictive as an adventure game, but still a pleasant diversion.

The cassette also contains Noughts and Crosses and Lunar Lander (joystick required). Although no new frontiers are crossed, the cassette is competently written, reasonably documented, and fairly idiot proof. As with all Salamander software, the cassette comes in a little library case similar to a video cassette holder. ▶

◀ For a selection of games it is good

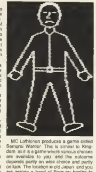
Another offering from Salamander is Golf The simulation is as close as the Dragon will allow and includes such features as choice of club and strength of shot The course is shown on a plan with the various features colour coded so as to help in choosing options Just to help the atmosphere (and destroy your nerve) there are additional bits of reality such as bunkers trees wind velocity and direction that tend to interfere with your game

The graphics are adequate and this version compares well with others on the market I think I still prefer the outdoors version but Salamander's version would do well on rainy days (I still miss the nineteenth hole)

Hangman is one of those perennials that is easy to adapt for the computer and that software houses issue when they can't think of anything better to do — at least usually

Superhangman from Salamander seems to have had some thought and effort put into it There are three skill levels depending on how much help you want and a vocabulary which won't be quickly exhausted (the computer has a thousand words stored in its memory)

More than that the high resolution man whose life depends on your skill is convincingly done and a timer ticks away the last seconds of his life as you try to win him a reprieve All in all, if you haven't got it already this looks to be the version to go for



MC Lothlorien produces a game called Samurai Warrior This is similar to Kingdom as it is a game where various choices are available to you and the outcome depends partly on wise choice and partly on luck The location is old Japan and you are among a band of Samurai hoping to achieve a good score This can be obtained through fighting other Samurai defending helpless villagers or by committing Seppuku (the Japanese word for ritual self sacrifice)

Although the concept is a trifle gory the game is interesting and well thought out There are some graphics — Samurai versus bandits for example but it isn't as exciting as a Kurosawa movie I enjoyed the novelty of the game however and it certainly made a pleasant change from run-of-the-mill settings of most games

It is fairly clear to anyone entering a store like W H Smiths that the quality of software packaging is improving all the time Although this is pleasing to the eye the contents do not always live up to the expectations conjured up by the superb artwork It is also true that some excellent programs slip by unnoticed when they are concealed in simple covers

Microdeal is a case in point Some of its software is beautifully packaged but proves disappointing while the least flashy conceals originality Alcatraz II shows a fugitive from a Minotaur on the cover but in order to reach this stage you must negotiate prison guards and lasers This sounds quite inviting until you realise that the game uses low resolution graphics and being written in Basic does not have the speed of a machine-code program

The concept of the game is interesting but the result is merely average From the spelling and the fact that the instructions are in a short separate program it seems possible that Alcatraz II was designed for use with the Tandy Colour Computer

Planet Invasion again Microdeal's ▶

£5.95

Dealer
Enquiries
Welcome

£5.95

Dealer
Enquiries
Welcome

START PROGRAMMING NOW!

With **"The Power Of The Dragon"** (177pp) you can quickly and easily learn how to write structure and de-bug a range of first class programs on your Dragon 32
All aspects of programming covered and includes an easy to follow step by step guide
Why sit and watch your Dragon rule you when you can make it your slave at **£5 95** only plus 75p for p&p
Send cheque/postal order payable to **Vignesh Ltd.**

VIGNESH LTD
28 BIRLEY ROAD
LONDON N20 0EZ

VIGNESH LTD

I enclose cheque/postal order for £6 30 please rush me **The Power Of The Dragon**

Name

Address

LEARN PHYSICS WITH YOUR DRAGON

Two exceptionally high-quality educational programs written by professionals for school or home use

OHM — A program allowing you to simulate an experiment to verify Ohm's Law and test understanding with problems Colour graphics

£9.00 inc VAT, P&P

MOTOR — Superb animated colour graphics are used to teach the principles of the direct-current motor Problems test understanding of the rules connecting the direction of current, magnetic field and force

£9.00 inc VAT, P&P

Cheques/PO s to

GARLAND COMPUTING

35 Dean Hill, Plymouth, PL9 9AF

THE POLICY OF PSS IS TO GUARANTEE A COMPLETE REFUND IF NOT COMPLETELY SATISFIED WITH YOUR PURCHASE

Personal Software Services

Presents

Fantasy, Heroes & Realities for DRAGON 32K

PSS
TEXTSTAR
DRAGON 32K

PSS
DATAPLAN

TEXTSTAR 12·95

TEXTSTAR ENABLES THE USER TO CONSTRUCT FILES IN ASCII FORMAT WHICH MAY BE RECORDED ON CASSETTE TAPE AND SUBSEQUENTLY RELOADED FOR EDITING EXAMINATION OR PRINTING

TEXTSTAR MAY BE USED EITHER AS A WORD PROCESSOR INCLUDING ALL THE USUAL FUNCTIONS OR TO EDIT BASIC PROGRAMS.

TEXTSTAR WILL HANDLE UP TO 21000 BITS ON A 28K PROGRAM OR 32K MACHINES THIS IS THE EQUIVALENT OF 6 PAGES OF A4 TEXT PER LOADING.

DRAGBUG 12·95

DRAGBUG IS ESSENTIALLY A MACHINE CODE MONITOR FOR THE DRAGON 32K GIVING THE USER EASY WRITING, ENTERING AND DEBUGGING FUNCTIONS FOR MACHINE CODE WRITING IT INCLUDES ALL THE FEATURES OF PROFESSIONAL MONITORS FOUND ON LARGER MACHINES

ATTACK 7·95

ATTACK IS A SUPER FAST, ALL MACHINE CODE ARCADE STYLE GAME FOR YOUR DRAGON 32K

YOU ARE THE CHIEF SECURITY OFFICER ON THE PRISON PLANET 'KOVERTHI' WHERE ALL THE CAPTURED SPACE INVADERS ARE KEPT UNTIL A HUMANE WAY OF DEALING WITH THEM CAN BE FOUND THERE HAS BEEN A MAJOR BREAKOUT AND IT IS A RACE AGAINST TIME TO STUN THE INVADERS AND CARRY THEM BACK TO THE SECURITY COMPOUND AFTER BEING IN THE OPEN TOO LONG THEY MUTATE AND BECOME MUCH FIERCER SEE HOW LONG YOU CAN KEEP THEM ALL LOCKED UP FOR

DATAPLAN 12·95

DATAPLAN IS A DATABASE TYPE FILING SYSTEM WHICH ALLOWS THE USER TO ACCESS SORT AND PRINT INFORMATION AS IT IS REQUIRED

IT IS ENTIRELY MENU DRIVEN FLEXIBILITY IS ITS STRONG POINT

DATAPLAN WILL STORE UP TO 200 LINES OF INFORMATION EACH OF 64 CHARACTERS OR 100 RECORDS EACH OF 127 BITS.

STARTREK 7·95

THIS VERSION OF THE POPULAR GAME OF STAR TREK PUTS YOU IN COMMAND OF THE SS ENTERPRISE DURING THE WAR WITH THE EVIL KLINGONS YOU ARE TOLD THAT THE EMPIRE HAS BEEN INVADED AND IT IS YOUR MISSION TO DESTROY THE ENEMY.

FEATURES INCLUDE: BATTLE COMPUTER, LONG/SHORT RANGE SENSORS, WARP DRIVE, IMPULSE ENGINES PHASERS, PHOTON TORPEDOES ETC ETC.

PSS
DRAGON 32K

SEND CHEQUE OR PO TO PSS
452 STONEY STANTON ROAD
COVENTRY CV6 5DG

◀ has a gaudy sleeve This time the book can be judged from its cover' as this game is a competent version of Defender complete with smart bombs and high-speed machine-code action The scene is set rather differently In that caloxin crystals rather than small people are being lifted from the surface of the planet but the rest of the game should satisfy any Defender addict who wishes to play at home This game originates in the United States according to the copyright information

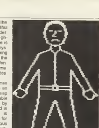
Microdeal s Ultimate Adventure 4 comes in a rather plain cover but inside lurks an entertaining adventure The locations leap from Arctic wastes to jungle with incredible rapidity but the program was written by someone with a sense of humour and is reasonable for a text-only game It is written in Basic but this is fast enough for this type of program My only serious quibble would be with the atrocious spelling — I counted eight mistakes in the instructions alone ("obsticals being one of the more amusing) This is a high number for a finished product and spoils an original game

Donkey King is the last from Microdeal and is a Dragonised version of an American original written for the Tandy by Tom Nix The cassette contains not one but three versions of the arcade game whose name differs only in one vowel True enough the only difference is that of the background/foreground colours but if you choose black and white the resolution is noticeably higher

When it comes to reviewing straight arcade copies the main criterion must be "how good is this version? This one lacks the caged gorilla threateningly shaking the bars but does have fireballs and a helplessly screaming Fay Wray

Despite a practice option I failed to rescue the girl and was regularly crushed to death by barrels and/or fireballs Written in machine code the game is fast enough to be addictive and I found that one humiliating failure was quickly followed by another as my finger acting against my better judgement insisted on another go

Forbidden City is an adventure game from Apex Trading of Brighton The object as always is to amass as much treasure as possible without falling foul of the unpleasant things that lurk within the walls



of a city As adventure games go I was not particularly impressed It is purely textual which means that the descriptions have to be inspiring amusing or original and here they are barely adequate It is fun to play but not really in the addictive class

Cassette Two is the uninspiring title of a collection of games from Video Productions The tape seems to be good value in that it contains an index as well as six programs They are however very short and the graphics are the feeblest possible With the potential of the Dragon for excellent displays one wonders why programs should be produced using maths symbols to represent spacecraft This gives the games the feel of something written for the ZX81 Luckily the programs improve slightly towards the end of the cassette Although they are fairly idiot proof most users could write comparable games — so why buy this cassette?

Games Pack Two from Gem Software contains four games This collection is far more varied than the last and is far better value The first game is a flight simulator that enables you to attempt a landing provided you have a pair of joysticks "Attempt Is the operative word as it is not an easy task There are no graphics and the instrumentation is rudimentary but it is unusual to find so challenging a game amongst a collection

Hangman the second program is a reasonable version with the words stored in data lines so the program could be altered to contain your own words in a classroom or at home This is a lot better than the Dragon Data version The third game is called Speed Boat the object of which is to race down a river bursting balloons nothing out of the ordinary but quite entertaining

Ships the last in the pack is a version of the co-ordinate guessing game battleships You have to discover the position of the computer s hidden ships and if you are successful there is a display of the unfortunate ship being hit My criticism of this game is that the co-ordinates have their origin in the top left-hand corner and the y value has to be entered before the x co-ordinate which goes against the accepted conventions Apart from this it is an exciting game and completes a tape that represents good value for money

To complete this selection there is a financial cassette from Hilton Personal Computer Services — Personal Banking System This cassette contains enough functions to allow you to check on your own bank account It is menu-driven and can support separate data files It copes with standing orders and corrections to entries as well as printing statements which you can compare with the bank s

It could be used by a small business to check individual accounts but this might be risky — I managed to crash the program twice by entering values outside the permissible range A program with any business potential would not have allowed me to do this

To sum up it seems that there is still room for innovative software on the Dragon Six months ago Dragon Data released its first batch of programs and this is still able to hold its head up in the software marketplace Of the cassettes and cartridges reviewed here there seems to be a tendency towards over-charging for products that rarely rise above mediocrity If the quality of software is not improved more people will write their own Ultimately of course this would not be a bad thing

Software packages reviewed this month

Game	*Company*	*Game*	*Company*	*Game*	*Company*
Golf Games Compendium All £7 95	Salamander Software 27 Ditchling Rise Brighton BN1 4QL	Games Pack II £7 95	Gem Software Unit D The Maltings Sawbridgeworth Herts	Meterоids Asteroids Cosmic Invaders Starship Chameleon Cave Hunters Berserk All £19 95 Ghost Attack £24 95 Special Selection 1 Graphics Animator Personal Finance Special Selection 2 Computavoice Quest Madness and the Minoteur All £7 95	Dragondata — available from retail (prices shown are recommended only)
Forbidden City £4 95	Apex Trading 115 Crescent Drive South Brighton BN2 6SB	Cassette II £3 95	Video Productions 31 Delmar Road Knutsford Cheshire		
Personal Banking System £9 95	Hilton Computer Services 14 Avalon Road Orpington Kent	Planet Invasion Alcatraz II Ultimate Adventure Donkey King All £8	Microdeal 41 Truro Road St Austell Cornwall		
Samurai Warrior £6 95	MC Lothlorien 4 Grancy Road Cheadle Hume Cheshire				

GEM SOFTWARE

PROGRAMS FOR THE DRAGON 32

SULTAN'S MAZE by Christopher Hunt
Enter the 3D Maze in search of the Sultan's jewels. But beware, your strength may run out, or you may come face to face with the Mad Guardian. A multi-difficulty game with fantastic graphics and sound. Price £7.95

EDUQUIZ I by Peter Chase
Three real educational quiz games. Hit on the answer of your choice and be a winner! Eduquiz makes learning fun. On this tape, improve your knowledge of [illegible] Geography, Inventions and their inventors and the Kings and Queens of Great Britain. Price £6.95

EDUQUIZ II by Peter Chase
Three more subjects in the Eduquiz series. This tape helps you learn about [illegible] Writers, Painters and Musicians. Price £6.95

FUNMATHS I by Peter Chase
Improve your maths while you play these five great games! In Number Race you must beat the computer, or a friend, to exactly 100 by adding the numbers. Maths Maze asks questions as you walk your way around the maze. Chemist is a game of ratios, where you mix two chemicals trying not to get blown up. Dragon exercises your skill at estimating coordinates — you have to give the Dragon hidden in a grid. Last, but no means least, Simon tests your memory for tunes, colours & numbers. Price £6.95

DUMPACK V by W. E. MacDowan
Two great machine code games with fantastic graphics.
In Sea Raid you must land your plane on the aircraft carrier, after bypassing the clouds with magnetic bombs, but don't hit the ship. In Sub Chase you must depth charge the sub without being sunk. Both with 4 levels of play from easy to kamikaze. Price £7.95

ALIEN BLITZ by Peter Chase
Your craft is running low on fuel and you must land. You have to use your bombs to clear a space amongst the skyscrapers, but beware of [illegible]. A superb multi level action game for the Dragon with superb sound and graphics. Price £7.95

LYNX PROGRAMS
Please write or phone for details. All available by mail order from

GEM SOFTWARE
UNIT D, THE MALTINGS, SAWBRIDGEWORTH, HERTS
Telephone (0279) 723567
TRADE ENQUIRIES WELCOME PLEASE RING FOR DEALER PACK
Access orders welcome

DON'T MISS THIS INCREDIBLE OFFER!

50 GAMES £9·95

YES, 50 GAMES! on cassette for all the following
FOR YOUR MICRO

SINCLAIR SPECTRUM
ZX81 LYNX
DRAGON
ATARI VIC-20
APPLE
ACORN ATOM
BBC A/B
SHARP
ORIC 1
NEW BRAIN

50 games on a cassette
only £9.95

CASCADE SOFTWARE
CASCADES HOUSE
BARBARA'S LANE
LLANDYSUL
DYFED
S.WALES
SA44 5NA

SUPPLY CASSETTE 50 FOR ______________ COMPUTER
I enclose cheque/P.O.
DU 5 83
Name ______________
Address ______________

[illegible] only

ORDER NOW!

MST CONSULTANTS
offer
SERIOUS SOFTWARE for DRAGON USERS
Buy any TWO cassettes at £19.95 EACH inclusive
and get the **MST MAILER-ADDRESS BOOK FREE!**

MST Home Accounts £12.95 inc	Don't be caught out again by that unexpected bill or forgotten budget item. Display your household budget estimates and actuals month by month. Automatic surplus/deficit colour plots over 12 months. Printer copies of full financial monthly summaries. Insert projections for months ahead and see the effect in Dragon colour
MST Database £19.95 inc	Essential card index filing system with sorts, searches, field totals etc
MST Invoices and Statements £19.95 inc	Prints superb invoices and statements — in daily use. Discount and variable VAT calculations on invoices. Customer/Trader address storage. User-defined messages at foot of documents etc
MST Stock Control £19.95 inc	Produces stock-evaluation and reorder reports, stock lists. 200 stock items per file
MST Business Accounts £19.95 inc	Gives up-to-date Debtor/Creditor details and summaries on hard copy printouts. Other reports include Transaction [illegible] Search, YTD
MST Mailer £19.95 inc	A dedicated database which prints, selectively formatted address and other labels by Searchkey or Record Range. Search and Print option Browse Records etc. A beautiful program

Each program comes with descriptive leaflet, operator notes and sample printouts (where appropriate). All of our programs are user-friendly with concise screened instructions. Each customer will receive details of our hot-line link.

I authorise you to debit my ACCESS Account with the amount of £
Card Number
OR you can telephone your ACCESS order to 0626-833517
OR you can send your cheque/postal order to
MST CONSULTANTS
DEPT DU1
NEWTON ROAD
BOVEY TRACEY
DEVON TQ13 9BB

NAME
SIGNATURE
ADDRESS
DATE
CASH WITH ORDER PLEASE DU1

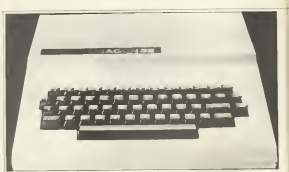
Bamby software
We have more new games for Dragon 32

◆

Golden Apples:	find the stolen apples, then defeat the warlock **£5.95**
Planetary Trader:	buy your cargo and lift your ship. The hard part is delivery **£5.95**
Surprise:	a dragon, spells, a magic ring but this is not another 'Lord of the Rings' **£8.95**
Amazing	series of five graphic mazes, aimed at children under 5 **£5.95**

◆

For further details or to order, please write to us at
Bamby Software
Leverburgh, Isle of Harris PA83 3TX
or phone **085 982 239** or **085 982 313**
anytime between 9 am and 9 pm



The Dragon is one of a new breed of computer designed to last a long time making it ideal for serious use as well as games

And in the red corner, we have the Dragon

For some people there is always that nagging doubt Did I buy the right machine? Or, as is more often the case was I given the right machine? ***Boris Allan*** *reviews popular home computers*

IT IS NEVER possible to buy the best computer because such a machine does not exist cannot exist The answer to the question Is the Dragon the best computer for me? is also equally uninformative the answer is Perhaps it all depends

There are quite a number of competitors in the race to produce a cheap versatile microcomputer and as it is difficult to evaluate any computer in a vacuum I will try to see how the Dragon 32 compares with three other home computers

The three computers I have chosen to compare to the Dragon are the ZX Spectrum the Commodore Vic20, and the Acorn BBC Computer and they have been chosen to exemplify different styles of computing, and different philosophies of design

A computer can be designed down to a price that is the manufacturer starts out with a price and then builds a machine which can be sold profitably at that price The Sinclair machines are examples of this 'built to a price philosophy it is obvious that the prices of £125 and £175 were fixed well in advance of the machine, before it was built because that was what it was felt that the market could stand

Another example of the price-dominated mentality of Sinclair machines is the £50 compact disc promised when the Spectrum was launched the disc has not yet been launched (we do not even know if it is a disc) but it is still priced at £50 — though the disc is now going to have a device to attach it to the Spectrum at some extra cost The disc price has remained constant the price of attaching (and therefore using) the disc seems to be increasing

The Spectrum was also sold for quite a time by mail order only and this again, showed the "money at all costs mentality There are an untold thousand and one stories (plus) about long waits for the Spectrum and advertisements being produced offering the Spectrum within 28 days when many people maintain that there were no Spectrums in production

The BBC computer is unfortunately tarred with the same brush sale by mail order, with no machines to support the advertisements though in the case of the BBC there were a few in specialist shops I say Unfortunately because the BBC computer was built to a specification and not mainly to a price

The specification of the BBC computer is very good and shows the influence of the accent on the specification being greater than the accent on the cheapness of the computer — though it is an unrealistic manufacturer who ignores the importance of price It is also an unrealistic manufacturer who ignores the specification to concentrate totally on price

If a manufacturer is willing to take money on the basis of a promise for the future we should be wary

The Vic20 was never sold by mail order It was sold at first in specialist shops which were Commodore agents and later in less specialist shops in the High Street By the time it was introduced into the UK the Vic had been on sale in other countries and the Vic was notable for the general lack of bugs when it was first introduced

The Vic was the first low price colour microcomputer of any importance and when it was introduced in 1981 it was priced at about £200 This now seems to be quite a high price and — as the profit margins on computers seem to be rather high — when the Spectrum came along to undercut the Vic the Vic's price took a drastic fall (as did the price of the ZX81)

How does this compare to the history of the Dragon? The Dragon was notable for being one of the first of the newer cheaper computers not to offer itself for months before its appearance as available within 28 days by mail order (The Vic was probably the first)

The Dragon was released only in shops and in quantity the Dragon appeared in many non specialist outlets but to assure a proper back up it is still wise to try to get a Dragon from a specialist store

The BBC and Spectrum are similar in that both relied on postal sales and the Spectrum is notable for relying upon mail order repairs Depending upon the mail as they do might explain why both Sinclair and Acorn seem so slow at communication The Vic Dragon and BBC can all be repaired in house by specialist suppliers whereas the Spectrum is a Sinclair problem

If the Vic and Dragon are not supplied by specialist retailers then they too have to be sent away — sometimes the same is true of the BBC

Different philosophies

I have spent some time on the boring subject of support and sales technique because quite often such things end up being very important support and the way the computer is sold tend to give valuable clues about the nature of the computer's manufacturer

The philosophy behind each computer is made obvious in many different little ways the type of keyboard the container which holds the computer the type of language the potential for expansion and other similar considerations

Once we start looking at these characteristics we can begin to learn about the Dragon what it can do why it can do it what it is capable of doing

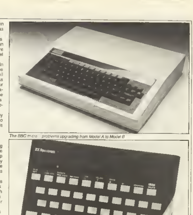
Start with how a user will approach each of these machines which of these machines is the most user friendly at the outset especially for a total novice? The answer has to be without doubt the Spectrum

The most important consideration in the design of the Spectrum (apart from being cheap) would seem to be the initial ease of use The Spectrum has a form of Basic which is easy to learn and does not require the ability to spell, because it uses keywords (one key only is used to produce Print)

The Basic has simple graphics commands which make complicated appearing figures able to be drawn with ease (as long as one only uses one ink colour)

A computer which is very easy to use at the outset is not always a computer which is easy to use when one wants more demanding things All the three other computers have proper keyboards though at the outset it might be more difficult to remember how to spell Print (or that on the Dragon colour is spell Color) ultimately it will be found that keywords are very restrictive and that the dinky touch-sensitive keyboard on the Spectrum is a pain

If a computer is designed to be easily extended then it must have a moving keyboard and not have to depend on private suppliers to produce proper keyboards An industry has grown out of the deficiencies of the ZX81 and Spectrum Of the three proper keyboard machines I have found that the nicest keyboard is that on the Vic though none of the three is poor


The BBC micro problems upgrading from Model A to Model B

ZX Spectrum
The Sinclair Spectrum has the least built in potential for extension

When we move to the languages available on the machines at one end is the Spectrum and Vic and at the other end is the BBC and the Dragon Though the Spectrum (like the BBC and Dragon) has special graphics commands the language as an entirety is limited and the Vic (though a colour computer) does not have in-built high resolution commands — though by buying a special Rom pack it is possible to add such commands to the language

With the Spectrum it is almost impossible to add new commands partly because of the extreme dependence in Sinclair Basic upon the use of keywords

Both the BBC and the Dragon use extended Basics and the languages have potential for expansion The Dragon's extended Basic is not as powerful as the BBC Basic developed by Acorn but given the content of most of the books published so far about the BBC computer the power of the BBC's Basic has not been recognised or used

Where some of the books on programming for the Spectrum and Vic are pushing the use of their Basics to the limit In the case of BBC and Dragon books this potential is still dormant As the BBC and the Dragon are both more complex machines the manufacturers themselves are probably not aware of the full potential of their own machines

As the Spectrum and Vic are inherently simpler machines it is far simpler to cover a larger area of knowledge about the machine This is partly why the manual for the Spectrum is so much more comprehensive than most other manuals One has to be very keen to get beyond the information in that manual

The same is true but less so for the Vic the Vic developed out of the Pet/CBM series of machines and that Basic has been very successful over a series of years When a colour graphics language is developed it makes sense to try to develop special graphics commands as part of the language and the Basic for the Vic did not make sufficient movements towards graphics eg the lack of high resolution graphics commands

BBC Basic is, as I have noted a potentially very powerful language — used to its potential — and though Dragon ▶

◀ Basic is less powerful in some respects some of the facilities on the Dragon are superior to those on the BBC

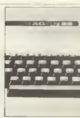
Commands such as Play or Circle (which can also draw ellipses) are very helpful though setting up a loop to play the same tune at all 255 different speeds is very wearing on the ears

A rather surprising omission in the Dragon's Basic is the lack of a facility for forming user-defined characters (a facility available on all the other three colour computers) David Lawrence (Chapter 5 of *The Working Dragon*) gives routines to overcome the deficiency

In terms of the loading and storing of the Basic programs you have written the Vic and Spectrum come out best — possibly because both are designed for the utter novice or possibly a variation in emphasis The use of cassette recorder on both Vic and Spectrum is easy though easier on the Vic than it is on the Spectrum (because with the Vic one has to buy a special Commodore cassette recorder)

On the Dragon and BBC the connection between computer and cassette recorder is by Din plug connected to three jacks it is possible to control the cassette recorder from the computer (as is possible with the Vic) The Dragon's commands Motor On and Motor Off are useful extra facilities on the BBC you have to pull out the Remote jack

For somebody such as myself I find the availability of the Tron (trace on) and Troff (trace off) to be highly useful Tron outputs on the screen the number of each statement as it is encountered within the program Again as a person used to more sophisticated systems the renumber command in Dragon Basic (Renum) is very helpful these are the type of commands normally provided by toolkits which are sold as extras on other computers



The Dragon — its chip wins

In the case of the Vic and Dragon it is possible to plug in cartridges which run instantly when the computer is switched on The use of cartridges means that the Basic system is frequently switched off and other languages can be used with the least difficulty, to load a language and compiler into Ram uses up space and thus restricts the room available for programs

On the BBC computer it is possible to insert Rom chips, with languages or utilities such as word processors but this is rather more tedious and less flexible (and more likely to lead to bent pins on chips) The Spectrum has no facility (in the design) to use Rom-based languages and utilities

The potential for improvement for the Dragon is greater than the potential of the basic machine in the case of the other three computers The reason why this is so is that the microprocessor for the Dragon is the Motorola 6809 whereas for the Spectrum it is the Zilog Z80 and for the other two it is the MOS Technology 6502

Over a wide range of benchmarks running machine code the 6809 was upwards of 1½ times faster than the Z80 or 6502 and 6809 Uniflex Pascal (Pascal like Basic is a programming language) was only 1½ times slower than a Z80 using assembly language (68 *Micro Journal* Vol 3 (4))

The Dragon is then a potentially powerful machine if it is possible to use a common language such as Pascal and be only slightly slower in running than a machine code program on other computers this gives the user great power It is far simpler to write a program in an ordinary language such as Basic (or Pas-

Wizard Software

FOR THE DRAGON 32

SMASH £7 00

A super break out type game in high resolution graphics Features include a demonstration mode 9 bat angles and walls of increasing difficulty from a single wall up to a full three walls Continuous display of score best score and balls remaining RECOMMENDED BY THE MICROCOMPUTER SOFTWARE CLUB

ALIENS + £7 95

A machine coded Arcade game presented in high resolution graphics Features 40 invaders mother ship 4 defenders per wave 4 shields + bonus shields Continuous display of score during game

DRAGON STARTREK £8.45

A real-time version featuring a 10x10 galaxy shield control photon torpedoes status reports signals received galactic search scanner control warp drive star bases with docking black holes planets and planet landfall pulsars novas stars asteroids meteors shuttles and shuttle docking automatically converging and attacking Klingons Four levels of difficulty comes with instruction manual

All prices inclusive mail order cheques or postal orders to

WIZARD SOFTWARE, DEPT DU, PO BOX 23
DUNFERMLINE, FIFE KY11 5RW

Also available from software retailers
Send large SAE for full program catalogue
Royalties paid for superior quality DRAGON software

MAKE THE MOST OF YOUR DRAGON 32

Two great books to help you tap the power of your Dragon 32

MAKING THE MOST OF YOUR

MAKING THE MOST OF YOUR DRAGON, by Clive Gifford leads you through programming the Dragon from first principles and includes more than 150 complete programs including major arcade games **£5 95**

DYNAMIC GAMES FOR THE DRAGON 32 — Tim Hartnell and Robert Young Thirty magnificent games for the Dragon are lurking in this 180 page book to make your computer behave just as you hoped it would when you bought it Programs include MAGIC CASTLE SNARK ATTACK SPACE RESCUE REVERSI/OTHELLO CHECKERS and CUBIK'S RUBE Just **£4 95**

Interface Publications Dept DU 44-48 Earls Court Road London W8 6EJ
I enclose £ ______ Please send me the books indicated
Dynamic Games for the Dragon 32
Making the most of your Dragon
Name
Address

cal) and takes much less programming time so that if the resulting program is not that much slower there is no need for writing in machine code

When we talk about the basic machine we realise that few computers ever stay as the Basic machine and become extended in many directions An important point to consider is thus the ways in which a computer can be extended

The computer with the least built-in potential for extension is the Spectrum and that with the greatest potential is the BBC Computer (Model B) At the moment the computer with the greatest range of peripherals is probably the Vic partly because it has been around for the longest and partly because it was designed to use many of the peripheral devices available for the Pet/CBM series

Though many private firms have produced extras for the Vic Vic owners are encouraged by Commodore to buy Commodore peripherals — starting with the obligatory special cassette recorder In terms of its initial design though the Vic is limited

Considering that the Spectrum has now been with us for quite a time there has been little produced to expand its potential By expand its potential I do not mean the production of proper keyboards or sound boxes to amplify the Spectrum s tiny chirrup but items such as discs Most of the expansion of the Spectrum can be seen to be to remedy deficiencies in the original Spectrum buying a soundbox and keyboard (to try to attain the facilities of the Vic or Dragon) will bring the price above £200 mind you, to increase the size of memory on the Vic to any decent amount is also going to be expensive

Moving up

One thing there is for the Spectrum, are games galore however, for how long will the Spectrum be Sinclair's main machine? Will there be any easy way of upward compatibility? (Tandy s TRS-80 series are very good at assuring upward compatibility)

The BBC has the greatest potential because it was so designed but even then there have been problems with the upgrading from BBC Model A to Model B With the up-coming 'Tube the BBC computer will be able to use other microprocessors (such as the Z80 or 6809 or the NS16032) as well as other devices The BBC was produced before the Spectrum appeared but it is only now that discs have become readily available The BBC is a proper machine designed to be of use for quite a few years The Spectrum one feels is not intended to have such a long life though some think that the ZX81 is a disposable computer The Spectrum is still too expensive to have reached that stage How long will the keypad last?

The Dragon is one of a new breed of computer computers which are not designed to be this years computer but designed to be of longer validity On those grounds alone of the four machines I could only recommend the BBC or the Dragon for anything which pretends to be

Increasing memory size on the Vic is expensive

a serious use So how have I found the Dragon performs when I am using it?

I hate computers without an On/Off button I find something primitive about having to unplug everything or to pull out the jack so I was pleased to discover the button at the rear I was also pleased to find that (unlike Acorn computers) I did not have to buy a lead to connect my computer to the cassette recorder I like the reset button as well as the break key and was glad that when I reset the system I did not lose my program (to be recalled by Old as has to be done on the BBC) Switch on and wait

I get the heading and start typing nice feel to the keyboard No lower case pity it can tart up printed output quite nicely but who really cares? The colour wavers after a while and goes and I wonder if this is anything to do with the fact that the sound comes out of the television speaker The reason why I wonder this is that the same happens on my television when I use a Vic the Vic also sends sound to the television speaker

The problem is definitely due to my television because I have used Vics which are well-nigh perfect on other televisions but they collapse into black and white on mine The colour of the Spectrum and the BBC is always good on my television and both those have internal speakers (and little else in common)

Having made my first mistake I have an error message an incomprehensible ?SN at line something or other Looking at the list of errors I find I have made a syntax error and given time I expect I would be able to decipher most of the error codes at sight and as there are 24 errors which can be reported I reckon that error-reporting is quite good But what was the error?

I am used to typing in programs where spaces are not significant (ie spaces between letters do not matter) Searching through the Dragon manual I could not find where it was explained but it seems that in Dragon Basic spaces are sometimes needed and sometimes they are not — my error seemed to be in a For loop It took quite a time before I realised that this was what was producing the error and the manual did not help greatly here

Reading the section on For Next loops (p 56) I came across the interesting line

```
20 FORI=AtoBSTEPC
```

where it was not too clear where there were spaces and the TO part of the statement was printed as "to

What the Basic interpreter was doing was taking a line FORI=NTOM as equivalent to FOR I = NT with the rest of the line missing (Dragon Basic thinks that the variable NTOM is NT it forgets all letters after the first two) This should be made much clearer

The Dragon is in good company (eg the Atom and the IBM Personal Computer) in being fussy about spaces but it should be made clear What makes it more complicated is that sometimes spaces do not matter

As a machine the Dragon has great potential but to use that potential the manual should have some explanation of how memory is set out and to find that out needs reference to the four sides called "Additional information Even then the information is fairly uninformative A further useful item is a list of useful locations such as those in the helpful sections of the Spectrum manual, or those in the Apple II documentation Others le s bigoted than myself found the manual quite helpful (but in time ?)

Having to edit out my syntax error once I had found what it was came very easily with the Dragon s Edit command and after some experience with the editor I was very impressed I was also very impressed by the need for a repeat key

With the 6809 chip being the best 8 bit chip available I am looking forward to trying out languages such as Forth which are perfectly suited to the chip s power and capabilities All in all the Dragon is a machine with potential as well as present attractiveness

Acknowledgements

I would like to thank NSC Computers 29 Hanging Ditch Manchester (061-832 2269) for their help assistance and advice

Active Software...."SECOND TO NONE"

" The best buy must now be the recent Games Tape 1 from a new source Active Software - which has taken some established ideas and implemented them beautifully using all of the Dragon's facilities cleverly. There are eight games several of them as good as those offered elsewhere as individual cassettes " (YOUR COMPUTER — APRIL 1983)*

Better than any I have had before " W PATTON (Cheshire)

This tape is by far and away the best we have You are to be congratulated on the end product " M RAVENSCROFT (W Mids)

I have received immense enjoyment from each of your games without exception " B. HUMPHRIES (S.Wirral)

8 Superb full length programs on one cassette. An incredible 200K of impressive programming, spectacular colour graphics and sound effects!

Interplanetary Trader

A massive 30K of real time adventure trading in the year 2293 Encounter the hazards of space flight pirates meteor storms energy loss etc Comprehensive on-board computer gives status reports damage reports warnings etc Definitely a challenge

Wumpus Mansion

Incredible fun! Outwit the Wump (if you can) and raid the mansion Collect treasures and Wumpus Blasters and escape through the maze of tunnels but don't trigger the TIME BOMB Different each time you play Uses 28K!

Hi-lo

Is it skill or luck? Turn £50 into £1 000 000 with this simple yet highly entertaining game Brilliant sound effects and 4-colour hi res graphics Uses over 20K!

Atom Hunt

95 per cent full colour graphics! Another superb feat of programming to stretch your mind and your Dragon's memory chips to the absolute limit! 1-4 players individual ratings Includes a unique repeat game facility Uses over 20K!

Execution

Superb hi res moving graphics game Play the computer or an opponent Features inexhaustable data base continuous scoring overall rating 1-4 players and good sound effects Hours of fun guaranteed! A massive 30K

Wipeout

Challenging game of fast reaction that begins easy but gets progressively harder 1-4 players on-screen scoring good sound effects and 4 colour graphics Be warned — this is not easy!

Snail Pace

The graphics are excellent — the excitement is almost unbearable 1-9 racing snails whizz up the racecourse to the finishing line Computer calculated odds and form that really works A superb piece of complex programming ensures hours of entertainment A massive 28K!

Air Assault

A simple yet addictive game in full 4-colour hi res graphics Attempt to blast the skyscrapers to make a space and land your crippled helicopter Uses sound and realistic movement of helicopter

COMPREHENSIVE 3 PAGE INSTRUCTION SHEET IS INCLUDED

GAMES TAPE 1

8 game cassette Just

£6.25

which includes postage and an UNCONDITIONAL REPLACEMENT guarantee

JOYSTICKS NOT NEEDED

In the unlikely event of our product failing to load just return it to Active Software for an immediate replacement

Why not put a first class stamp on your order and we will despatch your cassette within 48 hours of receipt

Active Software
117, Ickneild Street,
Birmingham
B18 6RZ.

*compendium category

ALL ORDERS DESPATCHED WITHIN 48 HOURS OF RECEIPT

Post coupon now to:

Active Software
117 Ickneild Street
Birmingham B18 6RZ

Please rush me a copy of GAMES TAPE 1

I enclose a Cheque/P.O for £ ______

Name: ______________________

Address: ______________________

____

____

____

John Symes A good Dragon program could be converted to Tandy and marketed in America the royalties could be considerable

Microdeal fills software gap

*Software Editor, **Graham Taylor,** talks to **John Syme** of Microdeal, one of the first firms to develop a full range for the Dragon 32*

FOR TWO COMPUTERS that appeared in significant quantities at approximately the same time it is surprising how different is the state of the software markets for the Sinclair Spectrum and the Dragon 32

The long established ZX suppliers took only a few months to get to grips with the new machine and began to produce interesting new programs that made full use of its potential

Despite being well received by the computer press and being the one big sales success of the parent company Mettoy the software market for the Dragon has been both small and uninspired

Many of those who bought their Dragons at Christmas and who are not yet skilled enough to write their own programs were disappointed

One of the companies trying to transform this situation is Microdeal a St Austell-based software house which specialises in Dragon software

Microdeal began as a one-man operation with company director John Symes distributing Tandy Colour computer software from home We decided to take on a new computer and the Dragon sounded interesting explained John

It is tempting to suppose that just as Spectrum software could develop naturally from the ZX81 so the Dragon could depend on the constantly emphasised link between itself and the Tandy as a similar basis for development According to John this link is more fiction than fact certainly a good deal of conversion is required Ninety nine per cent of the material for the Tandy colour won t work on the Dragon

This is a fact important to John since at the moment nearly all the games he markets are converts from Tandy originals

Apart from the technical difficulties there are other problems It certainly isn t a question of converting everything available for the Tandy in America into programs for the Dragon over here there are important differences in the markets

In a way we re selling an American product to English people it s important to remember that American programs are written for American tastes — they don t like complicated adventures for example and are very much more add on minded

There are a lot of things like Rom packs for programming Epsons that we could adapt from the Tandy but the market isn t interested

It was again a question of adapting a Tandy original with their first significant serious program the Telewriter word-processor John is very proud of it Telewriter is our first ever business program it proves the Dragon isn t just a toy

Although the Telewriter looks like being a success it seemed to only emphasise the question I implicitly raised at the start Why do we have to rely on a converted American original — where are all the British Dragon programs?

John shrugged his shoulders What little we ve seen in Britain just hasn t been good enough I think it s partly because the 6809 is an unknown processor over here those who understand machine code have often learnt it in college — that usually means a Z80

John also lays part of the blame squarely on Dragon itself 'Dragon has been of no help whatsoever to any of the software houses they didn t even tell us they had reconfigured the Ram — it meant we had to withdraw two games

People bought games after playing them in the shop but found they didn t work on their machines at home — naturally they assumed the machine was at fault — it must have cost Dragon a lot of money in unnecessary repairs

Whatever the initial setbacks Microdeal is now doing well although John was reluctant to go into details Let s just say we are meeting the market demand

Microdeal currently has four staff and may take on more to cope with the demand Up to a month ago it was virtually running from home but we needed to get a 24-hour turnaround

John was keen to stress the importance he places on speed

Orders on my desk by nine were packed and ready to go by ten thirty To be honest mail-order is a pain with all the time it takes up but it s necessary until the dealer network builds up

Now that Dragon software is starting to be produced in substantial quantities building up a reliable dealer network is obviously a major objective but it has to be done carefully We won t let just anyone sell our stuff — people have to be able to get the correct back-up advice and information — most prospective distributors are turned down

His concern that as the fledgling market is developing the retailers should be protected is reflected in his uncompromising attitude towards software libraries We don t let them have anything — how can the dealers survive if we do?

Perhaps as a sign that British programmers are finally waking up to the potential the home grown machine represents Microdeal is soon to produce its first game from a local programmer — a version of backgammon utilising a light pen

Certainly John hopes it s only the beginning It isn t from choice that I m paying thousands of dollars in American royalties I d much prefer to see British programmers getting their act together

If anyone has got a decent Dragon program they d be crazy not to do something with it

Remember the whole process could work the other way a good Dragon program could be converted to Tandy and marketed in America — the royalties could be considerable

AVAILABLE NOW

DRAGON 32 OWNERS

AVAILABLE NOW

Now you can buy a professional disk system to turn your Dragon into a real computer!

DELTA

△ DELTA GIVES YOU:—

- High speed mass storage of programs and data
- A fully integrated disk operating system included in the controller cartridge
- Available with or without disk drives
- To all standard 8" 5¼" and 3" MCD1 disk drives
- Full featured file handling included in the D.O.S.
- No modifications required — just plug in and run
- Comprehensive user manual included
- Up to 1.6 Megabytes of storage using 5¼" double sided disk drives
- Different drive types supported by one controller cartridge
- Supports up to four double sided drives (most systems only support two)
- Housed in attractive plug-in cartridge
- LOW COST —

△ DELTA SYSTEM 1

Controller inc DOS + ⅔rd height canon 40 track
disk drive + all cables + comprehensive manual
£299.99 inc VAT

△ DELTA SYSTEM 2

Controller inc DOS + ⅔rds height cannon 40 track
double sided disk drive + all cables + manual
£345.95 inc VAT

△ DELTA CONTROLLER

Controller inc DOS + comprehensive manual
£99.95 inc VAT

P&P Controller only £3.50 Controller + one disk drive £5.50 SAE for further details

PREMIER MICROSYSTEMS

A DIVISION OF PREMIER PUBLICATIONS

208 Croydon Road, Anerley, London SE20 7YX.
TELEPHONE: 01-659 7131

BARCLAYCARD VISA

BUY A BRAND NEW DRAGON 32 FROM THE EXPERTS

The leading UK Dragon House, Premier Microsystems, can supply you — right now — with a factory fresh **Dragon 32**, plus a free cassette lead and 3D Maze program

£199.50 inc VAT + £3.00 p&p

IN ADDITION

Premier Microsystems can **GUARANTEE** you the following.

1. Instant delivery of an exciting range of Dragon Software (with more to come!)
2. Honest expert advice on your purchases
3. The best available technical support to you the customer
4. Constant advice & help to all customers through a regular Dragon Newsletter and a Customer Phone-In Evening

QUALITY SOFTWARE

(Available Now!)

PLEASE NOTE All games require total concentration and can become addictive!

ADVENTURE PLUS	£9.95
DRAGON STRATEGY PACK	£7.95
DRAGON PERSONAL PACK	£7.95
CATACOMBS	£7.95
ACCOUNTS TRAINER	£19.95
CAVERNS OF DOOM	£5.95
DUNGEONS OF DEATH	£7.95
DRAGON TOWER	£7.95
CRIBBAGE	£9.95

PLUS 75p P&P PER ORDER

For all information or orders for Dragon contact the experts

CALL 01-659 7131

PREMIER MICROSYSTEMS
208 Croydon Road, Anerley,
London SE20 7YX.

EDUCATIONAL SOFTWARE

(Available now!)

MATHS GAMES PACK	£9.95
PAIRS	£7.95
SPELLING TEST & MATHS EXERCISE	£7.95
FRENCH VERBS	£7.95
PLANT (ECOLOGICAL)	£7.95

PLEASE SEND ME THE FOLLOWING, IMMEDIATELY.

______________ £ ______________

______________ £ ______________

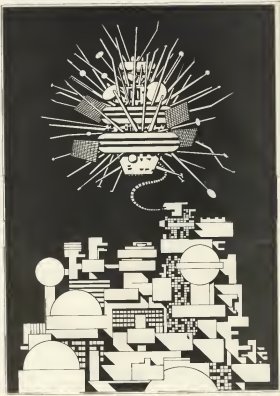
I ENCLOSE A CHEQUE/PO FOR THE TOTAL

Name ______________

Address ______________

____

______________ Postcode ______________



Landing on the lunar hover pad

***David Windle** introduces a new game for the Dragon 32 which uses the high level graphics commands to draw the lunar landscape*

IMAGINE YOU ARE a pilot on an earth mission to Saturn It is a mission that has gone badly wrong A fire on board the Probe Mother Ship has wiped out all but a handful of the crew You have managed to get the survivors into the one serviceable shuttle which has taken three months to get you back to lunar orbit

Your problem now is to land the shuttle on the Hover Pad at Moonbase Alpha The three-month journey has left you with only 200 units of fuel Your navigator has got you across millions of space miles to within 50 miles of the lunar surface Now you find that the low level homing navcom has been damaged The landing will have to be manual

You are not sure of the landing tripod and have been advised to use the emergency hover pad at Alpha built in the early colonisation days This pad holds the ship a few feet above the surface so enabling damaged ships to off-load passengers and cargo through extending umbilicals

On reaching a predetermined height above the pad the ship is locked into position held within a powerful magnetic field

There is a moderate solar wind blowing your shuttle down range from the pad towards the inhospitable moon peaks If you should run out of fuel you have just one chance If you can hit the eject button in time the survival capsule will blast away from the shuttle and you will be back to square one with another 200 units of the fuel to use

If you are not quick enough or miss the eject button well

Program notes

This program uses the high level graphics to draw the lunar landscape and uses many of the other functions available on the Dragon

Line 140 draws the shuttle at the foot of the screen

Line 190 gets it and 300 puts it in position at the start of your descent

Line 360 uses the *ppoint* function to detect a crash landing whereas line 370 draws the magnetic field around the pad

Line 500 disproves the manual when it says that the Dragon will only print text in black on green (or vice versa)

Moonbase Alpha was submitted by D Windle of Nevern Road Rayleigh in Essex

```
  10  'MOONBASE ALPHA COPYRIGHT D  E
      WINDLE, 1982
  20  CLS3 FOR C = 224 TO 255 T = 0
  30  PRINT@C, CHR$(150) NEXT C
  40  PRINT@256," MOONBASE ALPHA '
  50  FOR D = 288 TO 319
  60  PRINT@D, CHR$(150) NEXT D
  70  PRINT@320," COPYRIGHT D  E  WINDLE
      1982"
  80  P$ = "T255,05,CCDDEEGGAAFAABBAACC'
      PLAY P$ + P$ + P$ T = 0
  90  FOR T = 1 TO 2000 NEXT T
 100  CLS PRINT@163," YOU ARE THE PILOT OF A
      LUNAR SHUTTLE  YOU HAVE TO LAND YOUR
      SHIP ON THE PAD ON MOONBASE ALPHA
      YOU HAVE ONLY 200 UNITS OF FUEL  GOOD
      LUCK  PRESS 'S' TO START DESCENT'
 110  PRINT@385,"CONTROLS 'U' = UP 'R  =
      RIGHT"
 120  S$ = INKEY$  IF S$ = "S ' THEN 130 ELSE 120
 130  PMODE 4,1,PCLS  SCREEN 1,1 COLOR
      0,5 DIM R(16,16,)
 140  R$ = "BM110,177,U3E3R4F3D3G3BL
      4H3R4BR2R4U3L4BL2L4D3F3G3R2
      BL4R2E3R1BR2R1F3R2L4
 150  L$ = "BM0,170,U5R49F6R3F8R20
      U14E4R45F5R20E7R10F5R2F9R13D
      22R35U25E20'
 160  B$ = "BM0,165,E7R2E9F12R2E8F
      4R2E6F4R2F4R2F12E15R3E5F5R2R1E4F6
      R3E8R2E7F12E9F12E4R2E7F6D3F16D2 '
 170  H$ = "BM206,147,R35D45L35U45"
 180  DRAW R$  DRAW L$  DRAW B$
 190  GET( 103,169) - (127,193),R,G
 200  Y = 15 X = RND(200)
 210  'FUEL SECTION
 220  F = 232
```

Continued on page 29

ELKAN ELECTRONICS

The Dragon Supermarket

One Stop Shopping

One-stop shopping for all your Dragon's needs!

If you own a Dragon 32 there's now no need to search through endless magazines or contact numerous different suppliers of software hardware and peripherals for your Dragon Just a phone call away or a FREEPOST letter (no stamp required) away - is **"THE DRAGON SUPERMARKET"** an ELKAN ELECTRONICS exclusive service for all Dragon 32 and Tandy color computer users

Ask for our free mail order catalogue listing all (well nearly all) of the very many products we distribute games books software accessories etc - and we add to the list every single day

"THE DRAGON SUPERMARKET" is also distributed free every month with every copy of all the fabulous magazines we import from the U S A

the RAINBOW

RAINBOW A fabulous 200-plus page magazine imported exclusively by ELKAN ELECTRONICS and crammed full of programs hints tips for Dragon 32 and Tandy color computer users

Color Computer News

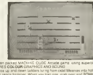
COLOR COMPUTER NEWS A companion magazine to Rainbow also devoted entirely to Dragon 32 and Tandy TRS80 color computers

Both magazines include an exclusive U K and European supplement with Dragon compatibility charts and FREE advisory service

Send £2 25 (plus large 50p s a e) or your Access or Visa card number for a sample copy of either magazine

ELKAN ELECTRONICS FREEPOST 11 Bury New Road
Prestwich Manchester M25 6LZ or telephone 061-798 7813
(24 hour service)

BONKA FOR DRAGON 32



Action packed MACHINE CODE Arcade game using superbly animated HI-RES **COLOUR** GRAPHICS AND SOUND

Chase up and down ladders luring homicidal Meanies into holes dug with your space hammer When you trap one rush over and BONK him on the head But hurry! If you loiter he will climb out and fill in the hole The slightest touch from a Meanie and you are electrocuted

Just to add to your problems, your **OXYGEN** is running out

FEATURES INCLUDE

4 different screen layouts

Score and Hi Score counter displayed on screen. Hall of Fame high score record Four selectable speeds and up to nine Meanies to start. More points scored for more levels Meanies fall NO JOYSTICKS NEEDED

SOLD ON CASSETTE **£7 95**

PRICE INCLUDES VAT POST & PACKING

Cheques and POs payable to

J MORRISON (MICROS) LTD
2 Glenadale Street Leeds
Yorkshire LS9 9JJ Tel (0532) 480987
Callers welcome
Other software available for Dragon
Send SAE for details

J. MORRISON (MICROS)

MONSTER SOFTWARE CLUB

SOFTWARE LIBRARY FOR THE

DRAGON 32

TOP QUALITY CASSETTES FOR HIRE
ALL TAPES USED WITH THE
MANUFACTURERS PERMISSION
(WE PAY ROYALTIES)

SAE for details

MONSTER SOFTWARE CLUB
32 LENNOX DRIVE, LUPSET PARK
WAKEFIELD, WEST YORKS

DRAGONTREE PROGRAMS

TANGRAMS

The ancient Chinese pastime 50 problems to solve plus your own creativity

BOWLING

1 3 can play this realistic interpretation of tenpin bowling (Needs joystick)

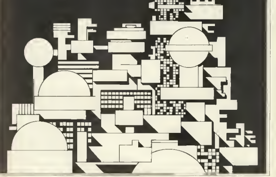
Both activities old and new will cost you only **£4 95** each inclusive or both for **£8 95** inclusive (cassettes)

Make cheques payable to

COPPICE SOFTWARE
(W G LITTLEWOOD & PARTNERS)
7 March Street, Kirton in Lindsey,
Gainsborough, Lincs DN21 4PH

```
230 DRAW "BM1 0 D9U4R2L2U5R4BR2D9R
    4U9BR2D9R4L4U4R3L3U5R
    4BR2D9R4
240 LINE (32 2) - (F,4) PSET BF
250 LINE (32 2) - (F 4) PRESET BF
260  LEFT HAND DRIFT
270 W = RND(3)
280 X = X - W
290 Y = Y + 1
300 PUT (X Y) - (X + 24,Y + 15) R,PSET
310 PAINT (0,180),0 0
320 PAINT (250 180)0,0
330 IF X < 3 THEN X = 5
340 IF X > 219 THEN X = 217
350 S = Y + 24
360 IF PPOINT(X Y + 16) = 0 THEN 500
370 IF S = 184 THEN DRAW H$
380 IF S = 184 THEN 540
390 A$ = INKEY$
400 IF A$ =  U  THEN Y = Y - 2
410 IF X < 1 THEN X = 2
420 IF A$ =  'U  GOSUB 480
430 IF A$ =   R  THEN X = X + 5
440 IF A$ =   R  GOSUB 480
450 IF A$ =   U  OR A$ =  R  THEN F = F - 2
460 IF F < 32 THEN 580
```

```
470 GOTO 230
480 PLAY' T 50 01,V5,CDEFGAB
490 RETURN
500 CLS  PRINT@ 226, ' CRASH LANDING NO
    SURVIVORS   SCREEN 0 1
510 PLAY  T200 05BGD 04BGD 03BGD
    02BGD 01BAGFEDC T100 01BAGFEDC
    T50 BAGFEDC T10BGD
520 CLS  PRINT@226  ' ANOTHER TRY? (Y/N)
530 INPUT T$ IF T$ =   Y  THEN RUN ELSE 530
540 CLS  FOR N = 1 TO 1000 NEXT
550 PRINT@226   WELCOME TO MOONBASE
    ALPHA YOU HAVE 'F' UNITS OF FUEL LEFT
    SCREEN 0 1
560 PLAY 'T6 04 CP4L2CL3D,03B
    04CDEP4EFL2EL4DCL3DC
    03L2B 04L2C
570 RUN
580 CLS 8 PRINT@224,'  OUT OF FUEL      EJECT
      EJECT
590 N = 1
600 SOUND 225,1
610 N = N + 1
620 N$ = INKEY$  IF N$ = ''E ' THEN 630 ELSE 600
630 IF N < 10 THEN RUN
640 IF N > 10 GOTO 500
```



Getting the most out of graphics

***David Lawrence** introduces two of the most underused commands in Dragon Basic, GET and PUT, and shows how the manual got it wrong*

LOOKING AT THE programs published in magazines suggests that one area which many Dragon users have not really begun to explore is the use of GET and PUT. If that's true, then it's a great shame because in many ways it's these two commands which make the Dragon's graphics capabilities stand out from those of other micros on the market.

Other micros have sophisticated line drawing commands, the ability to colour in limited areas of the screen, the ability to print the same design at a different angle. But how many have the ability to photograph part or all of their own screen for later use? Using GET and PUT to do just that, the painfully slow graphics procedures that so often bedevil Basic programs can be revolutionised.

So why is it, at the moment at least, that GET and PUT aren't more prominent in people's programs? Well, almost inevitably a large part of the blame has to be laid at the door of the Dragon manual. Even those Dragon owners who have become used to detecting the inadequacies of the manual will probably not have discovered that when it comes to GET and PUT the manual is not merely inadequate, it is a disaster. With the best will in the world, GET and PUT are consigned to the backwaters of programming by the manual for the simple reason that the amount of memory necessary to use the two commands on an area of screen is overestimated.

According to the manual, to store a screen area of 20*20 Pixels in the highest resolution mode (PMODE 4) requires an array of 20*20 or 400 elements. Since each element in an array requires five bytes of memory, such an array would require some 2000 bytes of memory to store only a relatively small design. To store a whole screen using GET would be a literal impossibility on either the 32K or 64K machine, since it would require an array of 192*256 elements, a total of 49152, taking up nearly a quarter of a million bytes of memory.

The largest design that a 32K machine could actually store, with no Basic program cluttering up the memory at all, would be some 6000 Pixels in size, say 80*75. What that means in practice is that anyone following the Dragon manual's advice on using GET and PUT would find themselves limited to the storage of no more than a few moderate sized designs before running out of memory. Far better, it would seem, to use relatively complex and considerably slower DRAW commands whenever any considerable area of screen is being dealt with.

The GET command does not need anything like one whole array element to remember each separate Pixel on the screen. In fact, in the highest resolution mode it needs only 1 bit (eight bits to a byte, remember). Of course, when you come to think about it, this is quite logical. In PMODE4, with only two colours on the screen at any one time, all that needs to be remembered about the state of each Pixel position on the screen is whether it is on or off, a task for which a single bit is ideally suited since it, too, can only be either on or off.

Saving memory

In other, lower resolution, PMODEs the situation is slightly more complex, though the memory saving is even greater. So how exactly does this work out in practice? Consider the following table:

ARRAY SIZE CALCULATIONS

PMODE	DIVISOR	ARRAY ADJUSTMENT
4	8	5
3	8	5
2	16	5
1	16	5
0	32	5

The table provides a straightforward method of calculating the most economical size of array in which to store a given area of screen. It is used in the following way:

1) Determine the size, in high resolution Pixels, of the area of screen to be saved. Thus if the design to be saved covers the top left hand corner of the screen for 50 screen positions to the right and 50 screen positions down (i.e. 0-49 in both directions) its size will be 50*50 high resolution Pixels, or 2500.

The reason that high resolution Pixels are specified is that it does not matter at this state which PMODE you are in. All screen measurements on the Dragon are done on a 256*192 grid representing the Pixel positions in PMODE4. Your 50 by 50 area may actually contain 2500 useable positions (PMODE4) or 12*12 positions (PMODE0), according to the smallest block available in the PMODE you are using.

2) Divide the number you have obtained by the number in the divisor column opposite the PMODE you are using. If the result is not an integer number, then round it up to the next highest integer. In the case of our example, a 2500 Pixel area, if we were using PMODE 4, 2500 would have to be divided by 8, giving a result of 312.5 or, when rounded up, 313.

3) You have now calculated the number of bytes you will need in order to store that area of screen — you must now calculate the minimum size of array that will contain this number of bytes. This is simply done by dividing by five. Once again, if the number is not an integer it must be rounded up. Referring again to our example, 313 must now be divided by five, giving a result of 62.6, which rounds up to 63.

4) Having settled on the number of array elements you need, all that remains is to declare a one dimensional array equal to the number you obtained via the calculations above. In the case of our example this would require an array such as A(63).

The result of all this is that an area of screen which would have required, if the advice of the manual had been followed, an array of 50*50 elements, or some 7500 bytes of memory, has been reduced to 63 elements, or some 300 bytes. The requirement for a full screen is reduced to only some 6000 bytes (1200 array elements). This is still a sizeable chunk of memory but not so large that even two or three different screens cannot be stored, if necessary, alongside a fairly substantial program, even in high resolution modes. Quite an improvement on a quarter of a million bytes for one screen!

In use

Free from many of the constraints of memory, GET and PUT take on quite a new lease of life. One of the first areas you might like to explore is exactly the one which seemed so impossible before, and that is the storage of whole screens of graphics.

Imagine that you have written a game which involves a fairly complex screen design which needs to be reprinted afresh with some regularity. No doubt the original design was set up using some combination of DRAW and PSET commands. This is fine for the initial set-up but it can become extremely tedious if it has to be done too often.

The speedy solution, provided that you

```
100 PMODE 4 PCLS SCREEN 1,0
110 FOR I=1 TO 191 STEP 2 FOR J=1 TO 255 STEP 2 PSET (J,I) NEXT J,I
120 DIM A(1229)
130 GET (0 0)-(255 191) A G SLIGHT PAUSE HERE
140 PCLS
150 IF INKEY$="" THEN 150 PRESS KEY TO REINSTATE SCREEN
160 PUT (0 0)-(255 191) A PSET
170 GOTO 170
```

Listing 1 a whole screen can be stored in an array

```
170 IF INKEY$=" " THEN 170'PRESS KEY WHEN READY TO SAVE
180 CSAVEM "PICTURE",1536,1535+6144,6144
```

Listing 2 – saves your graphics as a block of memory on tape

have around 6000 bytes of memory left is to set up the initial screen and then GET it into an array From then on whenever you need to reset the screen you need only PUT the array back on to the screen While for a simple design this is hardly worth it the difference in speed for a complex design is dramatic and can make the difference between an amateurish program and one with all the slickness of a professional product *Listing 1* shows how a whole screen can be stored in an array and later replaced on the screen

On occasions however you may well be pushed for space The lines necessary to set up the design in the first place may take up a considerable amount of memory and it may not be practical to add to that a large array no matter how much you desire to speed up the program In that case why not consider setting up the initial design storing it on tape seperately from the program itself then reloading it when the same is played and GETting it for use in the game — doing away with the need for all those DRAW PSET and PRINT commands in the main program itself

Procedure

All that you need to do is to design your screenful of graphics When it is done to your satisfaction save it as a block of memory on tape using lines such as those in *Listing 2* which are meant to be added to *Listing 1*

The three numbers in line 180 refer to the beginning of the memory area the finish point and the number of memory locations Provided that you are always starting at page one in the video memory the figures for the various PMODEs would be as follows

PMODE	START	FINISH	SIZE
0	1536	3071	1536
1	1536	4607	3072
2	1536	4607	3072
3	1536	7679	6144
4	1536	7679	6144

If you wish to use video memory starting at any other page but 1 then you must add 1536•(page no 1) to the first two numbers

You can now add *Listing 3* to the main program It will pick up the screenful of graphics from tape (it s best to store it immediately following the main program on the tape so that there s less fiddling about) All the graphics commands can thus be omitted from the main program Not only does this technique allow you to save memory, it s also extremely impressive when you show the program to your friends with complex graphics appearing out of nowhere in a program which apparently has no graphics commands!

You will note that in these listings I have included the G option in the GET statements, which means simply that full graphic detail is picked up into the relevant array This appears to make no difference to the memory demands There is no apparent hard and fast rule for when G must be included it is simply that some times its omission can give some strange results — whether you can leave it out is really a matter of trial and error in your particular application

```
190 IF INKEY$="" THEN 190 'PRESS KEY WHEN READY TO LOAD AGAIN
200 CLEAR PCLS DIM A(1229
210 AUDIO ON
220 CLOADM "PICTURE" 0
230 PMODE4 SCREEN 1 0
240 GET (0 0)-(255 191) A G
250 PCLS
260 IF INKEY$="" THEN 260 'RE[illegible] WHEN READY TO REINSTATE
270 PUT (0 0)-(255 191) A PSET
280 GOTO 280
```

Listing 3 – picks up the screenful of graphics from tape

You can also omit the PSET option from the PUT statement and obtain a big increase in speed PSET PRESET OR AND and NOT (discussed below) can all be used in a put statement without the inclusion of G in the GET statement Test this for yourself by removing the G from line 130 of *Listing 1* and running the program Now remove the PSET from line 160 and notice the increase in speed

GET and PUT are not limited in their usefulness to applications involving the whole screen or even large sections of it Properly used they represent not only a way to higher speed but a massive increase in the overall graphics capabilities of the Dragon compared to a machine which only has such commands as PSET and DRAW Many users have not discovered this because they have yet to see the real relevence of the PUT options PSET PRESET AND OR and NOT

The simplest of these options are PSET and PRESET To include PSET or PRESET in the PUT statement (e g PUT (X1 Y1) – (X2 Y2) A,PSET [or PRESET]) simply means that whatever was taken from the screen will be replaced as it was found (PSET) or inverse (PRESET)

Anything which was originally in the area on to which the design is being placed will be obliterated by the design contained in the array in exactly the same way that it would if you were over printing text In effect what the two options provide you with is a flexible form of graphics PRINT @ statement — flexible because you can specify down to the last Pixel where the character or design you have stored will be placed on the screen The PSET option is ideal for simple moving graphics where the characters do not have to move in front of existing material on the screen

Smooth moving

When the character to be used has been defined (probably using DRAW) simply GET a screen area which contains the character and a margin of blank screen on each side If you intend to move the character only one Pixel at a time then a one Pixel blank margin will do The character can now be moved smoothly around the screen always obliterating its previous position as it moves

Listing 4 gives a very crude example of a circle which moves in a straight line across the screen but there is no difference in principle for more complex movement Changing the PSET in line 160 to PRESET will illustrate the difference between the two options

The remaining three options available for PUT really do need to be explained together since it is not so much their individual capabilities but their interactions which make them so interesting

a)OR This option makes your PUT statement perform in a way very similar to the OVER characteristic on the Sinclair Spectrum What it does is to superimpose the design stored in the array on to whatever is currently in the target area of the screen Thus the original screen contents are not obliterated unless the design in the array covers all the pixels that were on (or rather set) before it was placed there

The result is a mix of both what was on the screen and what was in the array with any Pixel in the designated screen area being set if EITHER it was set before the PUT statement was executed OR it was set in the design stored in the array As we shall see this can be extremely useful when it is desired to move something through or over what is already on the screen

b)AND This leaves only those Pixels set which were originally set BOTH in whatever was on the screen before the PUT statement was executed AND are in the design stored in the array If you were to PUT a character on the screen and then PUT it again in the same position using the AND option you would see no effect because all the Pixels which are set coincide and thus they all remain set

If however you were to put a small outline circle within a larger one they would both disappear completely because they share no common Pixels Usually AND is at its most useful when employed with the next option NOT

c)NOT This may seem a strange one at first since provided that the array is of sufficient size to cover the screen area designated what is in the array specified in the PUT statement makes not the slightest difference to what happens on the screen What does happen is that within the specified rectangle on the screen any Pixel that was previously set is reset (switched off) and any Pixel that was previously reset is set. The contents of the rectangle are thus inverted At first sight this might not seem incredibly inspiring but together with AND it enables us to perform a very selective erasure from the screen

Listing 5 illustrates how an erasure of one design can be achieved without necessarily blotting out another design with which it shares an area of screen ▶

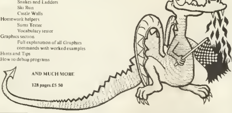
LOAD AND GO WITH YOUR DRAGON

32 PROGRAMS FOR YOUR DRAGON 32

- Games Pairs
  - Pontoon
  - Snakes and Ladders
  - Ski Run
  - Castle Walls
- Homework helpers
  - Sums Tester
  - Vocabulary tester
- Graphics section
  - Full explanation of all Graphics commands with worked examples
- Hints and Tips
- How to debug programs

AND MUCH MORE

128 pages £5 50



PHIPPS ASSOCIATES

Dept D FREEPOST EM463 (No stamp required)
99 East St, Epsom, Surrey KT17 1BR
Telephone 03727-21215 24hr phone service

Prices include postage but for air mail delivery in Europe add 90p (outside Europe add £1 70) per item

Access and Barclaycard accepted

DRAGON SOFTWARE

We offer a new mail order software service and can supply programs from most of the leading software houses. The following are a few examples — if you can't see what you want, please ask.

MICRODEAL		DRAGON DATA	
Donkey King		Astroblast	£19.95
Katerpillar Attack		Black Sanctum	£7.95
Cosmic Zap		Chess	£24.95
Talking Android Attack		Galax Attax	£19.95
Backgammon		Ghost Attack	£23.00
Galactic Ambush		Berserk	£19.95
These and all other Microdeal games available with Free Badge	£7.95	Meteoroids	£19.95
		Cosmic Invaders	£19.95

QUARX DATA		SALAMANDER		MC LOTHLORIAN
Flight	£8.50	Dragon Trek	£9.95	Samurai Warrior
M R C	£8.50	Wizard War	£7.95	Tyrant of Athens
Pontoon	£4.95	Grid	£7.95	Warlord
Look & Learn	£4.95	Games Compendium	£7.95	£5.00 each
Home Plan	£7.95	Vulcan Noughts & Crosses	£7.95	

A & F SOFTWARE		JOYSTICKS	PRINTER
[illegible]	£6.90	£19.95 pair	GP100A £215

WORD PROCESSING

JUNIPER. Menu/cursor + driver. Menu options include CREATE/EDIT SAVE/VERIFY/PRINT/TAPE-PRINT. Edit functions include repeat key, tabs, cursor up, down, left, right, delete up/down (lines), right, left (character) will operate with any printer **£25.00**
MICRODEAL Telewriter similar to Juniper but with 51 x 24 display block copy move/delete £49.95

ALL OUR PRICES INCLUDE VAT & P&P
SEND CHEQUE/PO/or ACCESS NO TO

JUNIPER COMPUTING

8 PEMBROKE GREEN LEA MALMESBURY WILTS SN16 9PB
TEL. 06662 2689

BOND SYSTEMS

YOUR DRAGON INCREASES YOUR LEARNING CAPABILITIES

VOCAB FRENCH and **VOCAB GERMAN** Transfer the 700 most commonly used words from computer memory into your memory

TOUCH TYPING. Your DRAGON can type at up to 100 words/minute. Can you? New system for quickly acquiring accurate high speeds. Typing speeds indicated throughout each session. Ideal for teaching yourself or others a useful skill

TRAINER. An almost universal self-teaching guide to learning almost everything. If your tape recorder uses the REM or AUX plug use this tape. Examples of MATHS, GEOGRAPHY, HISTORY, SPELLING and ADVANCED SPELLING are shown, together with details for the introduction of your own data

WAFFLE DODGER When you write do you use plain English or is it complicated and not understood? This program shows how good/bad your prose is

VOCAB FRENCH	£5.00
VOCAB GERMAN	£5.00
TOUCH TYPING	£5.00
TRAINER	£5.00
WAFFLE DODGER	£3.50

BOND SYSTEMS
15 BELMONT ROAD
HARROGATE
NORTH YORKSHIRE
HG2 0LR

```
100 DIM A(2)
110 PMODE4,1 PCLS SCREEN 1 0
120 LET D$='BM100 100 U2 E2,R2 F2,D2 G2 L2,H2' DRAW D$
130 GET (99 95)-(107,103),A,G
140 PCLS
150 FOR I=10 TO 100
160 PUT (1,I)-(I+8,I+8),A PSET
170 IF INKEY$='' THEN 170'THIS LINE IS OPTIONAL
180 NEXT I
190 GOTO 190
```

Listing 4 – shows a circle which moves in a straight line across the screen

```
100 DIM A(2),B(2)
110 PMODE4,1 PCLS SCREEN 1,0
120 LET D$='BM100,100;U2;E2 R2,F2;D2;G2;L2;H2" DRAW D$
125 IF INKEY$="" THEN 125'LINES ENDING IN 5 ARE OPTIONAL
130 GET (99,95)-(107,103),A G
140 PUT (99,95)-(107,103) A,NOT
145 IF INKEY$="" THEN 145
150 GET (99,95)-(107,103),B G
160 PCLS
170 PUT (100 100)-(108,108),A PSET
175 IF INKEY$='" THEN 175
180 PUT (107,100)-(115 108),A,OR
185 IF INKEY$='" THEN 185
190 PUT (100,100)-(108 108),B AND
200 GOTO200
```

Listing 5 – how to erase one design without blotting out another

```
100 DIM A(1),B(35) C(1)
110 PMODE 4,1 PCLS SCREEN 1,0
120 DRAW"BM100,100;U2;E2,R2,F2 D2 G2;L2 H2"
130 GET (100,96)-(106,102),A,G'NB NO BLANK BORDER
140 PCLS
150 FOR I=10 TO 200 STEP 10
160 PUT (I,100)-(I+6 106) A,PSET
170 NEXT I
180 GET (10,100)-(206 106),B G
190 PCLS
200 DRAW "BM100,100 E3,BL3,F3"
210 GET (100,97)-(103,100),C,G
220 PCLS
230 FOR I=15 TO 200
240 PUT (I 101)-(I+3,104) C,OR
250 FOR J=1 TO 50 NEXTJ'TIMING LOOP TO SLOW IT DOWN
260 PUT (10,100)-(206,106),B,PSET
270 NEXT I
280 GOTO 280
```

Listing 6 – provides a small cross moving along a line of circles

```
100 DIM A(1),B(35),C(1) D(1)
110 PMODE 4,1 PCLS SCREEN 1,0
120 DRAW"BM100,100,U2,E2 R2,F2,D2,G2;L2;H2"
130 GET (100,96)-(106,102) A,G NB NO BLANK BORDER
140 PCLS
150 FOR I=10 TO 200 STEP 10
160 PUT (I,100)-(I+6,106),A,PSET
170 NEXT I
180 GET (10,100)-(206,106),B,G
190 PCLS
200 DRAW "BM100,100;E3,BL3,F3"
210 GET (100,97)-(103,100),C,G
220 PCLS
225 PUT (10,100)-(206,106),B PSET
230 FOR I=15 TO 200
235 GET (I 101)-(I+3,104) D G
240 PUT (I,101)-(I+3 104),C OR
250 FOR J=1 TO 50 NEXTJ'TIMING LOOP TO SLOW IT DOWN
260 PUT (I,101)-(I+3 104) D PSET
270 NEXT I
280 GOTO 280
```

Listing 7 – gives faster and smoother movement for the cross

◀ If you enter and run the listing you find that two circles are printed so close to each other that the blank borders of the rectangles containing them actually overlap. They do not erase each other because the second circle is printed with the OR option.

One of the two circles is erased when any key is pressed by the printing over it with the AND option of an inverse copy which was created in line 140 by using PUT and NOT and then copied into a second array. When the inverse copy is placed over the original using AND there are no set Pixels corresponding by definition so the circle is obliterated.

However all the blank areas in the original design are replaced by set Pixels in the inverted array so where there is a set Pixel on the screen which is not a part of the design being erased it coincides with a set Pixel in the second (inverted) array and true to the rules of AND it remains set. Unfortunately if there are any Pixels shared by the two designs for instance if the two circles had been interlocking then those Pixels are erased.

More complex

The problem of erasing designs where they actually overlap others is not always quite as straightforward. Sometimes it is true the number of Pixels shared by the two designs is so small that their disappearance will make very little difference but this is not always the case. It is then necessary to reprint the design that you wish to leave on the screen.

Listing 6 shows how this technique can be employed to provide a small cross moving along a line of circles. All that happens here is that the cross is PUT on to the screen with the OR option so that it appears over any circle in that position. To erase the cross before it moves to the next position all that is necessary is to PUT the whole line of circles on to the screen again using PSET which erases the cross. The overall effect is one of motion by the cross along the line of circles and the method can be easily adapted to a variety of applications especially in games.

Where the design over which you wish to move something is changing so that you cannot keep PUTting the same background on to the screen the solution is to use GET to photograph the area of screen on to which the moving design is about to be placed and restore the background to that state when the moving design has to be erased.

Listing 7 illustrates how this can be done with the circles and the moving cross and shows that the movement is both faster and smoother than the previous method mentioned.

No doubt on first reading this seems to be overly complicated but half an hour's playing with the listings provided will reassure you that GET and PUT hold no horrors. What they do hold is a great deal of promise that many of us have only just begun to realise. More than that they provide a timely reminder that while few modern micros do less than their manuals claim the good ones are often capable of a lot more.

Getting to grips with handling file procedures

***David Lawrence** introduces some advantages and pitfalls of learning to use the Dragon's data files*

ALMOST ANY serious programming on the Dragon will sooner or later require the use of data files, that is the saving of bodies of data on tape so that they can be used later, thus avoiding the need to manually re-enter information each time a program is reloaded.

Data files are also invaluable in developing programs. Since the Dragon unfortunately clears its variables every time a change is made to a program line, a routine to save and reload the variables can be a life saver when the program is being debugged.

At the same time, data files can be one of the most frustrating aspects of Dragon programming for the simple reason that when things go wrong you cannot see what is on the tape to identify the problem. The purpose of this article is to identify some of the major pitfalls in using data files and to suggest ways of avoiding them. In order to illustrate the methods employed a specimen data file handling module is included.

One important point before starting to work with data files concerns the control of the cassette recorder through the remote socket.

A positive pain

No matter what the benefits when it comes to saving space on a tape, the Dragon's control of its own cassette recorder can be a positive pain when it comes to loading or saving data files while a program is running, since the user is no longer able to switch the motor on and off at will to position the tape correctly without disturbing the program in its operation.

One solution to the problem is, of course, to leave the control line unplugged. While this is perfectly acceptable when it comes to the loading and saving of programs or during the saving of data, it can cause problems when done during the loading of data files from tape. The reason for this is that in loading data from tape the Dragon will regularly pause to ensure that the data so far accepted is properly placed in the memory before accepting another batch. If the control line is connected then the cassette motor will be switched off during this pause but without the control line the motor continues running and the result can be that some of the data on the tape is missed.

The real solution to the problem is to include in the data file module a routine such as that shown in *listing one* — it is designed to allow easy positioning of the tape with the motor on and the contents of the tape relayed through the TV speaker.

```
1000 AUDIO ON:MOTOR ON:PRINT:INPUT "POSI
TION TAPE THEN PRESS enter  (MOTOR IS ON
)";Q$:MOTOR OFF
1010 PRINT:INPUT "PLACE RECORDER IN CORR
ECT MODE  THEN PRESS enter";Q$
1020 PRINT:PRINT "FUNCTIONS AVAILABLE:",
"1)SAVE DATA",,"2)LOAD DATA":INPUT "WHIC
H DO YOU REQUIRE:";Q:ON Q GOTO 1040,1100
1030 RETURN
```

Listing 1 – designed to allow easy positioning of the tape with the motor on (the £ symbol should be read as #)

```
1040 MOTOR ON:FOR I=1 TO 10000:NEXT I
1050 OPEN"O",£-1,"DATAFILE"
1060 PRINT£-1,N1,N2,V1,V2,V3,V4,V1$,V2$
1070 FOR I=0 TO N1-1:PRINT£-1,A$(I):NEXT
1080 FORI=0 TO N2:PRINT£-1,A(I):NEXT
1090 CLOSE£-1:RETURN
```

Listing 2 – printing a header for tape handling (the £ sign should be read as #)

```
1100 OPEN"I",£-1,"DATAFILE"
1110 INPUT£-1,N1,N2,V1.V2,V3,V4,V1$,V2$
1120 FOR I=0 TO N1-1:INPUT£-1,A$(I):NEXT
1130 FOR I=0 TO N2:INPUT£-1,A(I):NEXT
1140 CLOSE£-1:RETURN
```

Listing 3 – combining the listings gives a module adaptable for most filing purposes (the £ symbol should be read as #)

One important point before starting to work with data files concerns controlling the cassette recorder through the remote socke

before the user hands back control of the cassette recorder to the Dragon for either loading or saving.

Before saving data there is another important point with regard to tape handling which is illustrated by line 1040 of *listing two* — the printing of a header. If you have experimented with storing data on tape then you have probably already discovered that the Dragon is extremely finicky about what is on the tape when it first begins to listen.

If there is irrelevant noise or the improperly erased remnants of some previous file immediately before the specified set of data an error is flagged and the program stops. For this reason it is vital to ensure that a clear space is placed before each data file on the tape. The length of the header (as dictated by the size of the loop) is a matter of preference but having one as long as that shown has the advantage that if you accidentally begin recording at the very beginning of the tape it will carry you safely over the tape leader and no data will be lost.

Having set up your tape correctly the next necessity is to open communication between the Dragon and the cassette recorder (which the Dragon knows under the name of device −1 or #−1 for short). This is done automatically when programs are saved and loaded but with data you have to do it yourself.

The file you open can be one of two types: an output file (line 1050) for saving data to tape or an input file (line 1100) for loading data from tape. The file you wish to open must also have a name. If you are saving data then it will be saved under that name whereas if you are loading data the Dragon will not load a file with a different name.

So what can be saved? In fact anything that can be stored in the Dragon's memory though some of it requires some trickery. Examination of the specimen module should show that any numeric variable (or indeed a literal number if you like) and any text string can be saved or loaded simply by name using the formal PRINT# 1 or INPUT#−1. The main limitation is that you cannot save non-standard characters such as the low resolution graphics characters.

```
100 PRINT#−1,LEN(A$) FOR I=1 TO
LEN(A$) PRINT#−1,ASC(MID$(A$,I,1))
NEXT 200 INPUT # − 1, L LET A$ = "" FOR
I=1 TO L READ#−1,CH LET A$=A$
+CHR$(CH) NEXT
```

Table 1 – how to save a string of graphics characters

Should you wish to save a string of graphics characters — say a string that prints a design — you must translate each character into its ASCII code, save that number and then, on reloading, translate each number back into a character. The two specimen lines in *table one* show how it is done.

Loading

Another point of interest is what is not present in *listing three*, the loading routine. According to the Dragon manual it is almost obligatory to make use here of the EOF function. This stands simply for End Of File and is a way of detecting the special marker which denotes the end of the data stored on tape. The importance of this is that if the Dragon attempts to read beyond the end of the file it will encounter unintended data and probably stop with an error. EOF can be used to avoid this by including a line such as

```
100 IF EOF(−1) THEN GOTO 200
```

just before each group of items is read from the tape. If the end of file marker is encountered the program execution can be made to jump out of the module which reads the data. This function can clearly be useful in certain circumstances but in most cases it is unnecessary and can hide programming errors. The reason that it is unnecessary is that for the vast majority of programs the number of items of data of any particular type is, or should be, constantly recorded and updated in the form of variables used by the program.

In the module shown, apart from a few loose variables, the program is storing two sets of items on tape (the two arrays A$ and A) and the number of items in each set is recorded by the variables N1 and N2. All that is needed is to save N1 and N2 first and when the data is picked up from tape the module will know exactly how many items to read in order to input the whole file.

The reason I say that this is a better way of saving and loading data is that it will automatically highlight any errors in the way that data is being stored. Either precisely the right amount of data is present or an error is likely to occur. Using EOF this can be disguised since, whether or not the correct amount of data is present, the loading will terminate successfully at the end of the file.

It is as well to remember that you cannot load data into arrays that haven't been created. That is to say, it's no use loading your program from tape and then calling up the data file module unless, either in the main body of the program or in the routine represented by *listing three*, you recreate with DIM statements all the arrays that once held the data but which were not saved on tape. It's easily forgotten.

Lastly, when loading or saving is complete the file you have opened must be CLOSEd. The reason for this is that the Dragon can only cope with one file at a time and failure to close the previous one will result in an error being flagged the next time you try to communicate with the cassette recorder.

The three specimen listings, combined into one module, are easily adaptable for most filing purposes so without more ado you can get down to the task of applying your Dragon to some serious file handling.

Dragon's printing pleasures

Keith Brain explains how to make the most of your printer, from control codes to screen copying

THE SEIKOSHA GP 100A is a versatile and popular low cost dot matrix printer with the Dragon type Centronics parallel interface It can produce both single and double width character and also has a dot-addressable graphic printing mode

Printing mode selection

On power up single-width characters are produced but normal characters double width characters or graphics can be selected by simply sending the appropriate control code (CHR$(15) CHR$(14) and CHR$(8) respectively) to the printer by typing PRINT#−2 CHR$(X) The new mode will be held until it is countermanded or the printer turned off If you find no characters print out you have probably left it in graphics mode

Character sets

The GP 100A has four alternative character sets available and you need to decide which one to use The selection is made by means of an internal DIP switch so is really a set and forget decision Most of the characters in each set are the same but twelve differ Two of the sets produce unusual German and Swedish accented symbols and so are of little value to the average user The other choice is between the UK and USA sets which only differ in that in the UK set the hash sign is replaced by the sign for the pound sterling Certain other useful characters such as various brackets arrows and Greek symbols are also available via the appropriate character code

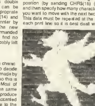
Listing Basic programs

The first use of a printer is to make program listings Typing LLIST will print out the current program until the program end is reached or BREAK is pressed The full width of the paper is used (80 columns) end lines automatically wrap round If you want larger print out change to double-width characters before typing the command LLIST

The PRINT#−2 command outputs ASCII character codes to the printer and the effects of punctuation are similar to on screen If you use this command in direct mode then nothing will print until you press ENTER If you want to include blank lines on the printer just send the carriage return control code CHR$(13)

Defaulting

The default print start setting is at the left margin of the paper If you want to move this to the right you need to first indicate that you want to make a change of print position (by sending CHR$(16) (POS)) and then specify how many character units you want to move with the next two bytes This data must be repeated at the start of each print line so it is best dealt with in a



FOR/NEXT loop Some print formatting can also be achieved by the PRINT#−2 USING format output list command

The text screen memory runs from 1024 to 1535 and you can easily PEEK what is on the screen However if you try to copy the characters on the text screen to the printer by PRINT#−2 CHR$(PEEK(1024+N)) you may not get the result you expect, as not all the characters are stored in the screen memory of the Dragon as their ASCII codes

To convert screen PEEKS to ASCII codes PEEKS between 96 and 126 need to have 64 subtracted PEEKS between 1 and 26 need 96 adding to them 0 needs to be changed to 32 and PEEKS between 27 and 95 print correctly

That is not as bad as it sounds at first and a whole screen copy can be produced rapidly by these two lines

```
10 FORY=0TO15 FORX=0TO31
A=PEEK(1024+X+(Y*32)) IFA>95
ANDA<127THENA=A−64ELSEIFA>0
ANDA<27THENA=A+96ELSEIFA=0
THENA=32
20 PRINT#−2 CHR$(A) NEXTX.
PRINT#−2 CHR$(13) NEXTY
```

A copy routine for the hi-resolution screen is invaluable but is a bit more complicated to achieve The Dragon hi-resolution screen is mapped differently according to the PMODE selected but fortunately the coordinate specifications used are the same for all modes

To see how the display is produced set PMODE0 1 Screen1 0 and then CLS when you will see a plain screen If you now POKE 1536 255 a dark band will appear at the extreme top left of the screen If you try poking smaller numbers into 1536 you will find this band changes and breaks up Poking 1537 will similarly affect the narrow strip which is to the right of 1536

The Dragon hi-resolution mapping system thus sets each screen point as one bit in this mode moving from left to right but with the most significant bit on the left. If you PSET(0 0 0) you will turn on the point in the extreme top left corner of the screen (that is the same as POKE 1536 128)

The GP100A looks at printing graphics in an up-and-down fashion rather than the side to side set up of the bits in the screen memory In graphics mode seven dots are addressed by setting bits 1 to 7 in a single byte with bit 8 always set To convert the screen image to printout we therefore need to look at screen position 0 0 If that bit is set then set bit 1 of the first byte to be sent to the printer

Moving down

We now need to move down the Y axis one point to 0 1 If this bit is set then set bit 2 of the first printer byte This must be repeated until seven bits have been tested and then the eighth bit set to complete the first byte

Fortunately Dragon Basic has PPOINT which actually checks the status of each bit on the screen (using the same coordinates for all modes) and returns a 1 or 0 but we still need to set the printer bits by adding the appropriate numbers to the first byte The sequence for the first byte is therefore

```
10 A=PPOINT(X Y)*1+PPOINT
(X Y+1)*2+PPOINT(X Y+2)
*4+PPOINT(X Y+3)*8+PPOINT
(X Y+4)*16+PPOINT(X Y+5)
*32+PPOINT(X Y+6)*64+128
PRINT#-2 CHR$(A)
```

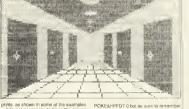
Moving across

Thus you move across the screen one X column at a time which is seven Y rows deep and when you have collected 255 bytes you need send a carriage return CHR$(13) and then move down the Y axis of the screen seven rows and start to calculate the next line of graphic print Note that in graphics mode no gaps are left between any of the lines so they will join up neatly

In the four colour modes bits are set in pairs to indicate the four colours

	First bit	Second bit
First colour	OFF	OFF
Second colour	OFF	ON
Third colour	ON	OFF
Fourth colour	ON	ON

and a consequence of this is that a four colour screen will print out as white black and left and right-handed zebra stripes There are ways around even that problem which allow you to produce more subtle shading as well as scaling and partial

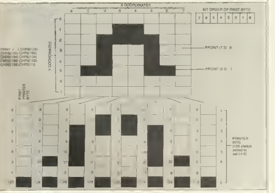


prints as shown in some of the examples

It is not necessary to have the screen-print routine included in a program producing graphics you may want to print You can store graphics (or even text) pages on tape by using CSAVEM and appropriate memory values according to the PMODE and then CLOADM them back for later printing

Although the screen to print conversion through Basic is not exactly superfast it proceeds at a reasonable rate especially considering there are up to 48K calculations to be made You can speed it up with POKE&HFFD7 0 but be sure to remember that you must reset the speed before you can save or load

A comprehensive menu-driven program for printing the Dragon hi resolution screen with the Seikosha GP100A is available from the author The program allows full or partial screen printing in black and white inverse black and white and four shades It also includes a scaling up facility and details of how to produce custom shading patterns It costs £5 95 on cassette or £2 95 as a listing Keith Brain s address is Penygeer Groeswen Cardiff CF4 7UT



```
PRINT # -2 CHR$(128)
CHR$(160) CHR$(188)
CHR$(134) CHR$(134)
CHR$(188) CHR$(160)
CHR$(128);CHR$(13)
```

Conversion of a high resolution screen to a GP100A graphics format

COMPUSENSE LTD
286D Green Lanes, PO Box 169
Palmers Green, London N13 5TN
Tel 01-882 0681 01-882 6936

SOFTWARE FOR DRAGON 32

1 DASM Machine Code DRAGON cartridge £18.95
A true 6809 assembler for the DRAGON computer. Assembly statements are entered in BASIC mode and can be intermixed with BASIC statements. Use BASIC for load and save and for editing source — easy to use and no time wasted learning new commands. A sophisticated product for a demanding task.

2. HI-RES Machine Code DRAGON cartridge £25.30
Tired of that 32 x 16 display? HI RES replaces the standard DRAGON display with a full 51 character by 24 line display. Ten different character sets (including most European languages). User defined characters. Mix High Resolution graphics and text on the same screen. Return to the standard mode at any time. A must for the serious programmer and essential for business programs. *We repeat that this replaces the BASIC input output routines. BASIC runs in 51 by 24 mode.*

3 DECODE Machine Code COLOR/DRAGON cartridge £18.95
This cartridge could save you a small fortune. DECODE converts TANDY COLOR programs to DRAGON format or vice versa. Load a TANDY COLOR tape on your DRAGON (or a DRAGON tape on your TANDY COLOR) and run DECODE to convert the program into the other BASIC. (It also works — convert back again!) Now all you COLOR computer owners can take advantage of all that lovely DRAGON software.

4. DEMON Machine Code Monitor COLOR/DRAGON cartridge £18.95
A complete system for entering machine code programs. As reviewed in Popular *Computing Weekly* Vol 2 No 4 — "easy to use ... a useful tool ... reasonably priced"

5 SPACE RACE Machine Code 16K COLOR/DRAGON cartridge £16.95 cassette £7.95
Action packed arcade game. Chase around the track destroying hordes of aliens — watch out for the mines. Uses keyboard or joysticks. 15 skill levels. high resolution graphics sound. Addictive.

6 C TREK BASIC 16K COLOR/DRAGON cassette £7.95
Super space adventure game graphics and sound destroy the Klingons before they get you

7 DESERT GOLF BASIC 32K COLOR/DRAGON cassette £7.95
High resolution display and good sound effects

8. POKER BASIC 16K COLOR/DRAGON cassette £7.95
Fast action, excellent graphics and sound, machine code assisted for speed

9 PIRATES AHOY BASIC 32K COLOR/DRAGON cassette £7.95
An adventure game. Solve the puzzles to find all the treasure — absorbing
Authorised Distributors for Spectral Inc USA, TSC Inc. USA, CSC Inc USA

Order by ACCESS/VISA or cheque by telephone or post. 24 hour answerphone service

DRAGON 32
NEW FROM
TROJAN
"SPACE TREK"

Space Trek is an absorbing space wars game in real time which can be played in any of four levels. Special features include: Onboard battle computer, long-range galaxy scanning, a galaxy containing 100 quadrants, impulse and warp drive speeds, shield control and status reports

THE TROJAN LIGHT PEN
PLUGS INTO JOYSTICK PORT
SUPPLIED WITH CASSETTE OF INSTRUCTIONS
A SIMPLE TO USE DEVICE FOR MICRO FANS

REVERSI
THE CLASSICAL GAME WRITTEN IN HIGH RES WITH COLOUR AND SOUND. 4 LEVELS OF PLAY. SUITABLE FOR ALL AGES

Send to
TROJAN PRODUCTS Dept DU
166 DERLWYN DUNVANT
SWANSEA, WEST GLAM SA2 7PF

Please send
SPACE TREK ☐ I enclose cheque/PO for £7.50
LIGHT PEN ☐ I enclose cheque/PO for £10.00
REVERSI ☐ I enclose cheque/PO for £5.50

All prices include post and packing

MR/MRS

ADDRESS

Let's face it — the sound from your Dragon 32 wouldn't win any prizes at an Eisteddfod. What you need is a

Dragon 32
SOUND EXTENSION MODULE

- Fully-cased module plugs into cartridge port
- Provides 3 channels of sound, 3-note chords and harmonies over 5 octaves
- Uses new BASIC command. No need to 'Peek' or 'Poke'
- Many built-in sound effects (e.g. bomb, laser)
- Music and graphics can occur together without loss of speed
- Based on popular, well-proven sound generator
- Two Input/output ports included
- User manual provided with examples

Cheque/P O to
J.C.B. (MICROSYSTEMS)
29 SOUTHBOURNE ROAD
BOURNEMOUTH BH6 5AE
Tel: (0202) 423973

ONLY
£34.95
Inclusive

Write or phone for further details

DRAGON
IN
DERBY

SOFTWARE
Microdeal, Salamander, Cosmo, Peaksoft, Dragon Data, Compusense, Romik etc. See the new Telewriter Word Processor from Microdeal

ACCESSORIES
Joysticks, Printers, Dust Covers, Light Pens, Graphics Planners and coming soon — Disk Drives

BOOKS
From the beginner to the machine code programmer we have books to suit everyone

Come to the computer experts at
FIRST BYTE COMPUTERS

FIRST BYTE COMPUTERS
10 MAIN CENTRE
LONDON ROAD
DERBY
Tel DERBY 365280

Next to House of Holland

Send us your Dragon programs, beginning with a general description and explaining how the program is constructed. Take care that the listings are bug-free. We pay £6 for each program published.

Open File

Hex

This program shows the graphics capability of the Dragon and the Tandy colour micros. Written in mode 3 a colourful and impressive display can be achieved with the minimum of programming. The game itself is a new version of an old Chinese boardgame.

The instructions are included in the print-out but the object of this two-player game is to be the first to build a bridge of counters across the hexagonal board whilst trying to block your opponent by trapping him/her. The first to do so wins the game (after a game is won the program must break and run again). This program was submitted by D Owen of Prestwich Manchester.

Program notes

Lines	
60 130	Opening program by asking for instructions
140-350	Instructions
370-400	Sets up mode colour of screen and characters
410-1010	Draws screen layout
1040 & 90	Test to determine set colour of point (X,Y)
1160	As there are 11 rows on the board CHR$(58), is used for 11
1170	As above 0 is used for row 10
1200-1300	The INKEY$ function finds letter on the keyboard being selected and converts it into a row number
1320	Computes area being tested in lines 1040 and 1090

Keys	
A-K	Rows 1-11 (rows A-K on screen)
1-	Columns 1-11 (columns 1-11 on screen).

```
 10 REM *************
 20 REM *      HEX    *
 30 REM *  BY D R OWEN  *
 40 REM *    JAN 83     *
 50 REM *************
 60 CLS(0) PLAY T255ABDGEO2AFDECGBFANDGCFEGABGFEGDFAGO3AGDL12GADB
 70 SOUND60 5
 80 PRINT@13 ' HEX ",
 90 PRINT@45 ' === ",
100 PRINT@96 "DO YOU WANT INSTRUCTIONS? (Y/N)'
110 D$ = INKEY$ IF D$ = Y THEN 140
120 IF D$ = N THEN 360
130 IF D$<> Y OR D$<> 'N THEN 100
140  INSTRUCTIONS
150 SOUND140 5
160 CLS(4)
170 PRINT@35 'THE RULES OF HEX
180 PRINT@67 "================
190 PRINT@129 THE OBJECT OF THE GAME IS TO BRIDGE THE PLAYING BOARD WITH YOUR
    COUNTERS EG BY TAKING TURNS, THE PERSON FIRST TO COMPLETE HIS BRIDGE ACROSS THE
    BOARD WINS WHITE GOES FIRST WATCH OUT FOR SOME SLY TACTICS!
200 PRINT@480 PRESS RETURN FOR MORE
210 F$ = INKEY$ IF F$ = CHR$(13) THEN 230
220 IF F$<>CHR$(13) THEN 210
230 CLS(3)
240 PRINT@2 "HOW TO PLACE YOUR PIECES
250 PRINT@34 '======================
260 PRINT@97, PIECES ARE PLACED ON THE BOARD BY INPUTTING THE CORRECT CO-ORDINATES
    OF THE DESIRED POSITION EG G,7 WOULD PLACE EITHER A WHITE OR AN ORANGE COUNTER
    ON POSITION G 7 AND SO ON
270 FORI = 1TO5000 NEXTI
280 CLS(6)
290 PRINT@35,"HINT ,
300 PRINT@67, '=====',
310 PRINT@129 'SINCE THE OBJECT OF THE GAME IS TO BUILD A BRIDGE ACROSS THE BOARD AS
    WELL AS TRYING TO BUILD ONE YOURSELF YOUR OPPONENT IS ALSO TRYING TO BUILD ONE
    SO A GOOD TACTIC WOULD BE TO BLOCK HIS/HER PATH '
320 PRINT@480 ' PRESS RETURN TO START
330 R$ = INKEY$
340 IF R$ = CHR$(13) THEN 360
350 IF R$<>CHR$(13) THEN 320
360' START
370 PMODES,1
380 COLOR6 7
390 PCLS
400 SCREEN1,1
410 FOR N= 11 TO 1 STEP - 1
420 X= 116 - 10*N Y0 = 12 + 8*N Y1 = 172 - 8*N
430 I - 0 TO N
```

Continued on page 40

```
440 X1 = X + 20*I + 10 X2 = X1 + 10 X3 = X2 + 10
450 LINE(X1 Y0 - 8) - (X1 Y0 - 3) PSET
460 LINE(X1 Y1 +8) - (X1 Y1 +13),PSET
470 IF I = N THEN 530
480 LINE(X1 Y0 - 8) - (X2 Y0 -11),PSET
490 LINE(X2 Y0 - 11) - (X3 Y0 - 8) PSET
500 LINE(X1 Y1 + 13) - (X2,Y1 + 16) PSET
510 LINE(X2 Y1 + 16) - (X3 Y1 + 13) PSET
520 NEXTI
530 NEXTN
540 PRINT(0 0) 6,6
550 FORI = 85TO90 PSET(14 1 5) NEXT PSET(12 85 5) PSET(12 90 5) PSET(16 90 5)
560 PSET(20 76 5)   PSET(22,77,5)   PSET(24 78 5)   PSET(24 79,5)   PSET(22 80 5)   PSET(20 81 5)
    PSET(20,82 5)  PSET(22 82 5)  PSET(24 82 5)
570 PSET(30 70 5)   PSET(32 69 5)   PSET(34 70,5)   PSET(34,71 5)   PSET(32,72 5)   PSET(34,73 5)
    PSET(34 74 5)  PSET(32 75 5)  PSET(30 74 5)  PSET(34 69 5)
580 FORI = 61TO66  PSET(44 I 5)  NEXT  PSET(40 61 5)  PSET(40 62,5)  PSET(40,63,5)  PSET(40 64 5)
    PSET(42 64 5)
590 PSET(50 54,5)   PSET(52 54,5)   PSET(54 54,5)   PSET(50,55 5)   PSET(50 56 5)   PSET(52,56 5)
    PSET(54 57 5)  PSET(54 58 5)  PSET(52 59 5)  PSET(50 58 5)
600 FOR = 46TO50  PSET(60 I 5)  NEXT  PSET(62 45 5)  PSET(62 51 5)  PSET(64,50 5)  PSET(64 49,5)
    PSET(63 48 5)
610 PSET(70 38 5) PSET(72 38 5) PSET(74 38 5) PSET(74,39 5) PSET(72 40 5) PSET(70,41 5) PSET(70 42,5)
    PSET(70 43 5)
620 PSET(82 30 5) PSET(80,31,5) PSET(80 32 5) PSET(84 31 5) PSET(84,32 5) PSET(80 33,5) PSET
    (80 34 5) PSET(80 35 5) PSET(84,34,5) PSET(84,35 5) PSET(82 36 5)
630 FORI = 22TO26 PSET(94 I 5) NEXT PSET(92 21 5) PSET(90 22,5) PSET(90 23,5) PSET(92 24 5) PSET
    (92 27 5)
640 FORI = 15TO18 PSET(100 I 5) PSET(104 I 5) NEXT PSET(102,14 5) PSET(102,19 5)
650 PSET(112 7 5) PSET(112,8 5) PSET(112 10 5) PSET(112 11,5)
660 FORI = 100TO105 PSET(10,I 5) PSET(14,I 5) NEXT PSET(12,99 5) PSET(12 102 5)
670 FORI = 106TO111   PSET(20,I,5)   NEXT   PSET(22 106 5)   PSET(24,107,5)   PSET(22 108,5)   PSET
    (24 109 5)   PSET(24 110 5)   PSET(22 111,5)
680 FORI = 115TO118 PSET(30 I 5) NEXT PSET(32 114 5) PSET(32 119 5) PSET(34 115 5) PSET(34,118,5)
690 FORI = 123TO128 PSET(40,I 5) NEXT FORI = 124TO127 PSET(44 I 5) NEXT PSET(42 123 5)
    PSET(42 128 5)
700 FORI = 131TO136   PSET(50 I 5)   NEXT   PSET(52 131 5)   PSET(54 131,5)   PSET(52,133,5)
    PSET(52 136 5)  PSET(54 136 5)
710 FORI = 139TO144 PSET(60 I 5) NEXT PSET(62 139 5) PSET(64 139 5) PSET(62 142 5)
720 FORI = 148TO151   PSET(70 I 5)   NEXT   PSET(72 147 5)   PSET(74,148 5)   PSET(72,152 5)
    PSET(74 151 5)  PSET(74 150 5)  PSET(74 152 5)  PSET(72 150,5)
730 FORI = 155TO160 PSET(80 I 5) PSET(84 I 5) NEXT PSET(82 157 5)
740 FORI = 163TO168 PSET(92 I 5) NEXT
750 FORI = 171TO175 PSET(104 I 5) NEXT PSET(102 171 5) PSET(102 176 5) PSET(100 175 5)
760 FORI = 179TO184   PSET(110,I 5)   NEXT   PSET(114 179 5)   PSET(114,180 5)   PSET(112 181 5)
    PSET(112,182 5)  PSET(114 183 5)  PSET(114 184 5)770 COLOR8 6
780 LINE(5  108)—(5 186) PSET
790 LINE(5,108)—(102 186) PSET
800 LINE(5 186)—(102,186) PSET
810 PAINT(6,115) 8,8
820 COLOURS 8
830 LINE(150 186)—(250 186) PSET
840 LINE(150,186)—(250,108) PSET
850 LINE(250 108)—(250 186) PSET
860 PRINT(249,185) 5 5
870 LINE(5 84)—(5 5) PSET
880 LINE(5 5)—(102 5) PSET
890 LINE(102 5)—(5 84) PSET
900 PRINT(6 6),5,5
910 COLOR8 6
920 LINE(150 5)—(260 5),PSET
930 LINE(250 5)—(250 84) PSET
940 LINE(250 84)—(150 5) PSET
950 PRINT(249,6), 8,8
960 FORI = 165TO174 PSET(194,I 8) PSET(204 I 8) PSET(210 I 8) NEXT
```

```
 970 FORI=0TO1
 980 PSET(196 169 + I) PSET(198 169 + I.8) PSET(200 169 + I 8) PSET(202,169 +I 8) NEXT
 990 FORI  =   0TO1 PSET(212 165  +  I 8) PSET(214 165  +  I.8) PSET(216 165  +  I 6) PSET(212 169  +
     I,8) PSET(214 169 + I 8) PSET(212,173 + I 8) PSET(214,173 + I) PSET(216 173 + I,8) PSET(218,173 +
     I 8) NEXT
1000 PSET(224 165 8)   PSET(224,166 8)   PSET(226 167,8)   PSET(226,168 8)   PSET(228 16 9 8)   PSET
     (228 170 8)    PSET(230 167 8)    PSET(232 166 8)    PSET(228 18 9 8)    PSET(228 170 8)
     PSET(230 168 8)    PSET(230 187 8)    PSET(232 168 8)    PSET(232,16 5 8)    PSET(228 171 8)
     PSET(226 172 8)  PSET(224 173 8)  PSET(224 174 8)  PSET(230 17,1 8
1010 PSET(230 172 8) PSET(232,173 8) PSET(232,174 8)
1020 GOSUB1140
1030 GOSUB1320
1040 IF PPOINT(X Y) =7 THEN 1069
1050 SOUND10 5 GOTO1020
1060 PRINT(X Y) 5 6
1070 GOSUB1140
1060 GOSUB1320
1090 IF PPOINT(X Y) = 7 THEN 1110
1100 SOUND150 5 GOTO1070
1110 PRINT(X Y) 8 6
1120 GOTO1020
1130 GOTO1130
1140 A$ = INKEY$ IF A$ = "  ' THEN 1140
1150 B$ = INKEY$ IF B$ =  '' THEN 1150
1160 IF B$ = CHR$(58) THEN B = 11 GOTO1200
1170 IF B$>< 0  THEN 1190
1160 B = 10 GOTO1200
1190 B = VAL(B$)
1200 IF A$ =  'A  THEN A = 1
1210 IF A$ =  'B' THEN A = 2
1220 IF A$ =  ' C  THEN A = 3
1230 IF A$  =  'D  THEN A= 4
1240 IF A$ = ' E  THEN A = 5
1250 IF A$ =  F  THEN A = 6
1280 IF A$ = ' G  THEN A = 7
1270 IF A$ = ' H  THEN A = 8
1260 IF A$ = "I  THEN A= 9
1290 IF A$ = ' J  THEN A = 10
1300 IF A$ = "K" THEN A= 11
1310 RETURN
1320 X = 7 + 10★(A + B):Y = 94 + 8★(A -B)
1330 RETURN
```

Basis of a text editor

Writing a program to read, edit and record a data file is straightforward, but if the same could be done for a program file then Dragon users would be able to move lines around, merge and append programs for instance. In short a text editor.

This program shows how to read in program into an array, which can then be manipulated as required.

First you must record the program to be read in ASCII format using *Csave* " name ",A. Don't worry about the unusual noises emerging from the Dragon during this operation. Then the following program will read it into array F$, a line to each element.

To edit the program just deal with each array element as if it were a string. To save the edited program, just write it to the cassette as if it were a data file, ie *Print* −1,F$(1),F$(2).

Don't forget to make enough string space available with a *Clear*. This program was submitted by M. Twigger of Fleet, Hants.

```
10 CLEAR 10000
20 DIM F$(200)
30 OPEN "I",  -1," name "
40 I=0
50 IF EOF(-1) THEN 100
60 INPUT  -1,E$
70 F$(I)=E$
80 I=I+1
90 GOTO 50
100 CLOSE  -1
```

NEW
BROADWAY
Sunshine presents a new star game for the ZX Spectrum (16 or 48K)
BLIND ALLEY
Simon Lane
THE WORKING SPECTRUM
A LIBRARY OF PRACTICAL SUBROUTINES AND PROGRAMS
DAVID LAWRENCE
The Working Dragon 32
SUNSHINE

Cruising on Broadway

Behind the wheel of your machine **Cruising on Broadway**. You look mean. People stop to stare. Suddenly a black-and white pulls onto the Broadway behind—its light flashing and siren wailing. The chase is on!

Cruising on Broadway is a tyre burning fast machine-code game for the 16 & 48K Spectrum. The further you can get the more difficult it becomes—cash prizes are being offered each month for the highest scores.

£4.95*

Blind Alley

A deadly duel, deep in space. **Blind Alley** is what passes for sport in the year 3017. Your craft must use strategy to out-wit and corral the opponent—in this crazy development of the p[illegible] games of the late [illegible] After each round in the enclosure game more drivers [illegible] sent against you to [illegible] your skill and agility. **Blind Alley** is the machine-code [illegible] of the future—now! For the 16 & 48K Spectrum

£4.95*

2 cassettes & 2 books from Sunshine

The Working Spectrum

(228 page book)

The first well-documented collection of serious programs for the ZX Spectrum. Programs include a Basic Renumber which can handle Gotos and Gosubs, a character dictionary, a file-handler, several utility programs and a few games. Each program is built up out of re-usable subroutines.

£5.95*

The Working Dragon 32

This is a companion volume to The Working Spectrum and includes several new features such as a Text Editor and a Music Composer and Editor. Other programs help you use the Dragon 32 as an accountant, for more advanced high resolution graphics, as a home tutor for education and for playing games. Each of the programs and subroutines is explained line by line to help develop your own programming skills.

£5.95

***Submit your program to Sunshine and your name could be here next month.**

SUNSHINE

Please send me

☐ The Working Spectrum [illegible]

☐ Cruising on Broadway at £4.95 [illegible]

☐ The Working Dragon 32 at £5.95 [illegible]

☐ Blind Alley [illegible]

[illegible] cheque [illegible] to [illegible]

Sunshine Books

Pacman

This is a Pacman-type game which has been translated from Sinclair Basic to Dragon Basic. The program takes up about 3K of Ram.

The object of the game is to eat as many of the power pills * and as many pills ' as possible before the ghost eats you. You or the ghost cannot go through walls. You can chose between two speeds fast or slow. This is asked for at the start of the game. If you get 5,000 or 10,000 points you get an extra life.

This program uses sound to tell you if you have any power or if you eat a power pill or if you eat a pill.

The program also has high scores and if you have the highest score it asks for your name. Then at the end of every game and if no one beats your score your name is printed up.

The program uses a Peek to find out if you have hit anything and the same with the ghost.

The program should be bug-free and I hope that all Dragon owners have a good time. A tip for Dragon owners.

If you are saving a program and you wish to find out if it is saved correctly then if you rewind your tape and then type in Cload "verify" then this checks if the program is saved correctly.

If you get a "?IO" error then it is not saved correctly. If it is OK then press reset to get back to your program. This does not go over the program in memory — that is if you don't have a program called "verify" on the tape. This program was submitted by B. Watson of Edinburgh.

```
10  REM  (C) 1/2/83 BRIAN WATSUN
20 CLS
30  INPUT 'FAST OR SLOW  ;A$
40  IF A$ - 'F' OR A$ - FAST  THEN
      POKE 65495,0
50  IF A$ = 'S  OR A$ - 'SLOW  THEN
      POKE 65494,0
60 G$ =  G : REM  INVERSE  G
70 SS = 0:LO = 0
80 LL - 4
90 CLS4
100 L = L + 1
110 W$ =  .'
120  RESTURE
130  FOR N = 0 TO 48  STEP   . READ
     A$: PRINT @N,A$;: NEXT
140 M = 465:G = 335
170  PRINT @19, POWER- ; INT (PO
     :: PRINT @51, LIVES- LL ; PRINT
     @51 + 3 , SCORE= ,SS:
180  PRINT @M, D';:MM   M
190  IF PO   4 THEN G$ =  G : REM
      INVERSE'G
200  IF PO      0 THEN PO - PO -
     .5
210  IF PO   4 THEN G$ -  G . REM
      NORMAL  G
220  IF PO      0 THEN PLAY (4L
     0G
230  IF PO = 1 THEN PLAY O1L   O
     2L200A03L200A04L20 A
240  PRINT @G,G$;:GG=G
250  IF SS = 5000 THEN LL - LL +
     1:SS = SS + 1
260  IF SS = 10000 THEN LL    LL +
     1.SS = SS + 1
270 O$ = INKEY$
280  IF O$ = 'I' THEN M - M -
290  IF O$ = 'M  THEN M - M
300  IF O$ =  J  THEN M - M   1
310  IF O$ =  K  THEN M = M + 1
320  IF  PEEK (1024 + M) = 9 THEN
     M - MM
330  IF  PEEK (1024 + M) - 106 THEN
     PLAY O4L25A :LO - 5 :SS   SS
      + 10
340  IF  PEEK (1024 + M) - 1   THEN
     PLAY O2L25OBL25ODL25OA :CO -
     CO + 1:SS = SS + 1
360  IF CO - 175 OR CO = 174 THEN
      LO   0: GOTO
370  GOSUB 400
380  GOTO 170
390  IF   MM: GOTO 280
400  REM  MOVE GHOST
410  RX =  RND (3)
420  RY =  RND (3)
430  IF RX = 1 THEN G   G + 1
440  IF RY - 1 THEN G - G -
450  IF RX = 3 THEN G = G - 1
460  IF RY = 3 THEN G = G +
470  PRINT @MM, ' ';
480  PRINT @GG,W$;
490 W$ =    '
500  IF G = M OR GG = M OR GG = M
     M OR G = MM THEN 560
520  IF  PEEK (1024 + G) = 9 THEN
     G - GG
530  IF  PEEK (1024 + G) - 110 THEN
     W$ -  .
540  IF  PEEK (1024 + G) - 106 THEN
     W$ = '*'
550  RETURN
560  IF PO    > 0 THEN 690
570 PLAY L100AL100BL50C"
580 LL = LL - 1: IF LL =  - 1 THEN
     600
590  PRINT @MM,  ';: GOTO 140
600  PRINT 'HARD LUCK YOU'RE TOO
     SLOW', HA  HA' HA''
610  FOR Y = 1 TO 10
620 PLAY'L200ABCDE-FBL200AL200BL2
     00C02D02E
630  NEXT
640 CLS
650  IF SS   HS THEN 670
660  IF SS , HS THEN HS = SS: INPUT
      WHAT IS YOUR NAME ';N$
670  PRINT ' THE HIGHEST SCORE WA
     S          'HS  BY 'N$
680  FOR I = I TO 5500: NEXT I: GOTO
     10
690  REM  EATEN GHOST
700 PO = 0
710 SS = SS +  RND (4) * 50
720 G = 335
730 PLAY L50ALI00BL150CL200D'
740  GOTO 170
750  REM  MAZE...ALL LETTER 'I' A
```

Continued on page 45

Classified

COMPUTER CORRESPONDENCE COURSES

LEARN TO MASTER THE DRAGON

A complete course in BASIC programming which is designed specifically for the DRAGON micro computer. It includes word processing, file management, stock-control, games and educational applications. Suitable for the complete beginner, hobbyist, teacher and business person.

Cost of Course
Including computer £292.40 (incl)
Excluding computer £98.50 (inc)
Price per Module £9.95 (incl)

For full details write enclosing s.a.e to

COMPUTER CORRESPONDENCE COURSES
Churchway West Ilsley
Nr Newbury
BERKS RG16 0AH
Tel (06328) 336

DRAGON 32 MERGE PROGRAMS

Programs can be fully merged on the Dragon 32. For full details and instructions send £1 plus sae to **G Grimwood, Allenwoods 185 Conway Road Colwyn Bay Clwyd**

CLASSIFIED ADVERTISING RATES

Line by line 20p per word minimum 10 words

Semi-display £6 per single column centimetre minimum length 2 cm (Please supply artwork as PMT or supply rough setting instructions.)

Conditions All copy for Classified section must be pre-paid. Cheques and postal orders made payable to *Dragon User* should arrive at least two weeks before the publication date.

If you wish to discuss your ad please ring Simon Langston on 01-930 3840

KOPIKAT

Dragon 32 Owners

Now available a KopiKat duplicating tape will copy most of your own m/c code tapes — even those with leaders — £15

KOPIKAT 2 Bell Lane
Narborough, Leicestershire

TALON

DRAGON/TANDY JOYSTICKS

Soft-Touch Button
Metal Stick
Armoured Cable (1.5m)

£15 PAIR
INCL POST

EXTENSION LEADS
First Metre £2 and £1 on the rest

104 Woodbridge Rd Rushmere
St Andrew Ipswich Suffolk IP4 4RA

PROTECT YOUR DRAGON with a fitted PVC dust cover only £3.85 inclusive. Sherborne Designs, Victory House, 8a The Bank, North Bradley, Trowbridge, Wilts. Tel 02214 4425. Access and Barclaycard. Covers for all computers, printers, monitors etc available. Dealer enquiries welcome.

AT LAST

AN ATTRACTIVE DUST COVER CUSTOM-MADE TO FIT YOUR DRAGON COLOUR CO-ORDINATING TO MATCH YOUR MICRO. SCREEN PRINTED WITH DRAGON

(Acorn have already officially approved our BBC cover)

ONLY £3.25 INC P&P

TRADE ENQUIRIES WELCOME

COTSWOLD COVERS PARK HILL
HOOK NORTON OXON

Mr Thomlinson
0608 737472

WANTED URGENTLY

Arcade type games for micros ZX81 Spectrum VIC II Dragon and One. We pay top royalties or buy outright. Any good games programs. National mail order and dealer sales ensure maximum reward for your work.

Reply immediately to
NORTHWISH
GROUND FLOOR
RALLI BUILDING
STANLEY STREET,
MANCHESTER 3
or phone 061-832 9143

DRAGON 32 JOYSTICKS

ONLY
£14.95
plus 75p p&p

Top quality, easy to handle joy sticks, for the enthusiastic games player

Available from

CASCOM
67 ELSTOW ROAD
BEDFORD MK42 9NT

Here's my classified ad.

(Please write your copy in capital letters on the lines below.)

£0.20	£0.40	£0.60	£0.80
£1.00	£1.20	£1.40	£1.60
£1.80	£2.00	£2.20	£2.40
£2.60	£2.80	£3.00	£3.20
£3.40	£3.60	£3.80	£4.00
£4.20	£4.40	Please continue on a separate sheet of paper	

I make this .... words, at 20p per word so I owe you £ ....

Name..

Address..

....

....

Telephone..

Please cut out and send this form to Classified Department *Dragon User* Hobhouse Court 19 Whitcomb Street London WC2

```
     RE IN INVERSE IN THE MAZE

760  DATA  'IIIIIIIIIIIIIIIIIII'
770  DATA  'I*...............*I'
780  DATA  'I..I..I..I..I..I..I'
790  DATA  'I..I..I..I..I..I..I
800  DATA  'I..I..I..I..I..I..I'
810  DATA   I.................I"
820  DATA   I .IIII.III.IIII. I
830  DATA  'I.................I'
840  DATA  'I.*I..I..I..I.*I..I'
850  DATA   I..I..I..I..I..I..I
860  DATA  'I.................I'
870  DATA  'I..IIII.III.IIII..I'
880  DATA  "I.................I'
890  DATA  'I.I...IIIIIII...I.I
900  DATA  'I.................I'
910  DATA   IIIIIIIIIIIIIIIIIII
```

Character generator

This program allows you to design 8 × 8 characters for the high resolution screen. When the program is run a large 8 × 8 grid appears on the screen.

In the top left hand corner is a flashing cursor; this cursor can be moved around the screen by the use of the four arrow keys. If you wish to fill any of the squares press the shift key as well.

When you have finished your design move the cursor out of the grid or into a blank square then press key S. The five arrays you can use (A to E) are plotted on the right side of the grid. If the array is empty a black square is shown. Any characters used can be stored on tape and then you can go back to them later for further use.

You can use other modes and colours by altering line 9030 but I have found that mode 4 is the most clear to use. This program was submitted to us by C. Roberts who lives in Bootle, Merseyside.

Program notes

Lines	
9000 9090	Sets up arrays and draws high resolution screen
9100 9320	Controls the cursor movement and reads the keyboard
9330-9390	Plots character at bottom of screen
9400 9440	Selects array to be used
9450 9510	Get's character from bottom of screen and stores this in the array selected then returns to high res screen

```
9000 REM DRAGON
      CHARACTER
      GENERATOR
9010 REM CLIVE ROBERTS 1982
9020 DIM Z(10 10) DIM A(8 8) DIM B(8 8) DIM
     C(8 8) DIM D(8 8) DIM E(8 8)
9030 PMODE 4 SCREEN 1 1 COLOR 0 1 PCLS
9040 DRAW  BM0 0R11D88R11U88R11D88R11
     U88R11D88R11U88R11D88R11U88L88
     D88R88U11L88U11R88U11L88U11R88
     U11L88U11R88U11L88
9050 PUT(150 0)   (157 7) A PSET
9060 PUT(170 0)   (177 7) B PSET
9070 PUT(190 0)   (197 7) C PSET
9080 PUT(210 0) – (217 7) D PSET
9090 PUT(230 0)   (237 7) E PSET
9100 VE   1 HO   1
9110 GOTO 9160
9120 FOR Y = 1 TO 50
9130 IF PEEK(337) < 255 THEN 9220
9140 NEXT Y
9150 RETURN
9160 PUT(HO VE)   (HO + 8 VE + 8) Z PSET
9170 GOSUB 9120
9180 PUT(HO VE)   (HO + 8 VE + 8) Z PRESET
9190 GOSUB 9120
9200 GOTO 9160
9220 PUT(HO VE)   (HO + 8 VE + 8) Z PRESET
9230 IF PEEK(337)   223 AND PEEK(344)   223
     AND HO < 77 THEN HO   HO + 11
9240 IF PEEK(337)   223 AND PEEK(343)   223
     AND HO > 1 THEN HO   HO   11
9250 IF PEEK(337)   223 AND PEEK(342)   223
     AND VE < 77 THEN VE   VE + 11
9260 IF PEEK(337) – 223 AND PEEK(341) – 223
     AND VE > 8 THEN VE   VE   11
9270 IF PEEK(337)   159 AND PEEK(344)   223
     AND HO < 88 THEN PUT(HO VE)   (HO +
     8 VE + 8),Z,PSET HO = HO + 11
9280 IF PEEK(337)   159 AND PEEK(343)   223
     AND HO > 1 THEN PUT(HO VE)   (HO + 8 VE
     + 8) Z,PSET HO   HO   11
9290 IF PEEK(337)   159 AND PEEK(342) = 223
     AND VE < 88 THEN PUT(HO VE)   (HO
     + 8 VE + 8),Z PSET VE = VE + 11
9300 IF PEEK(337)   159 AND PEEK(341) = 223
     AND VE > 1 THEN PUT(HO VE)   (HO + 8 VE
     + 8) Z PSET VE   VE   11
9310 IF INKEY$    S  THEN 9330
9320 GOTO 9160
9330 HO   1 VE –  1
9340 FOR Y – 5 TO 82 STEP 11
9350 VE   VE + 1 HO   0
9360 FOR X = 5 TO 82 STEP 11
9370 HO   HO + 1
9380 IF PPOINT (X Y)   0 THEN PSET (HO VE +
     150)
9390 NEXT X,Y
9400 CLS SCREEN 0 1
9410 PRINT  SELECT CHARACTER A TO E
9420 IF INKEY$ >      THEN 9420
9430 A$  INKEY$ IF A$<  A OR A$>  E
     THEN 9430
9440 D   (ASC(A$) –64)
9450 ON D GOSUB 9470 9480 9490
     9500 9510
9460 GOTO 9030
9470 GET(1 150)   (8 157) A G RETURN
9480 GET(1 150)   (8 157) B G RETURN
9490 GET(1 150)   (8 157) C G RETURN
9500 GET(1 150)   (8 157) D G RETURN
9510 GET(1 150)   (8 157) E G RETURN
```

Drawing

The line function on the Dragon is a very useful feature however it is limited to drawing a line from A to B or else use the Draw command.

Here is a program that you can feed into the Dragon then kick it around and have hours of fun. For example clock fingers moving at any speed, printing points of a circle or oval. It can be used in all kinds of programs. This program was submitted by W. Slater of Brampton, Chesterfield, Derbyshire.

Line 20 defines pi

The figure 30 in line 50 is half the number of lines or points to be drawn in the circle or oval

The figure 80 in lines 60 and 70 gives the size of the circle or dimensions of an oval

```
  10 P MODE 4,1. SCREEN1,1. PCLS
  20 DEF FN R (X) = 4 0 * ATN (1 0)
  30 FOR T = 0 TO 10000
  40 TIMER = 0
  50 A = T/30 * FN R (A)
  60 X = 128 + 80 * COS (A)
  70 Y = 96 + 80 * SIN (A)
  80 LINE (128,96) – (X,Y),PSET
  90 IF TIMER = 48 THEN GOSUB 1000
 110 NEXT T
 999 END
1000 LINE (128,96) – (X,Y), PRESET
1100 RETURN
```

Dragonet

This program was devised when playing around with the Draw command. Careful attention must be given to the instruction in the Draw command to prevent Paint spill. It is left up to you to discover exactly what it does. This program was submitted by J Trill who comes from Rochester Kent.

Program notes

10 120	Draw the figure
130 180	Movement

```
5      REM DRAGONET BY J. TRILL
10     PMODE 3,1 : SCREEN 1,0 : PCLS5
20     DRAW "BM130,178 ; S16C4D2L11U2E1U3E1U3H1
             U1H1L1H1L1H1L1U1L1U4H1U1H2U1H1U2H1U2
             E2U1E6R1E1R10F1R1E1R5D1R2F1R4G1D2
             F5D3G1D3G2D1L1G4L2G4D1G1D1G1D2G1D5"
30     DRAW "BM-15,-30 , E3R3F2D1G2L1G1L1H1L1H1U1E1"
40     DRAW "BM+18,+1 , U2E2R2F1R1D1F1G2L3H3"
50     DRAW "BM-1,+10 , U1H2G1H1L1G1L1G1L1G1R1F1
                       R1E1R2F1E1R2"
60     DRAW "BM+1,-10 ; H1G1D1F1E1U1 ; BM-4,0, H1G1
                       D1F1E1U1"
65     PAINT (120,160),4,4
70     DRAW "BM-7,-2; G2D2F1R1"
80     DRAW "BM+18,-1; L1H2U2E2"
90     PAINT (80,65), 2,4
100    PAINT (150,55),2,4
110    DRAW "BM 60,180; C4E5F1G5L2E3"
120    PAINT (62,179),4,4
130    CIRCLE (83,160),5,2
140    PAINT (83,160),2,2
150    FOR I = 1 TO 500 : NEXT I
155    CIRCLE (83,160),5,4
160    PAINT (83,160),4,4
170    FOR I = 1 TO 500 : NEXT I
180    GO TO 130
```

Noughts and crosses

This program prints the noughts and crosses grid on the screen and then invites you to play the game first by typing x or o depending on which you are and then by typing a number between 1 and 9 3 is top right 9 is bottom right etc This program is by C Davies of Eastleigh

Program notes

Lines	
2 10	Print headings and clear screen
20-60	Set hi res graphics and draws grid
70 100	Established whether it is x or o
500-600	Established position of x s on grid
700 800	Established position of o s on grid
2000 2430	Draw the x s on the screen
3000-3420	Draw the o s on the screen

```
   1 REM 'noughts and crosses
   2 REM 'CARL DAVIES, 1982
   3 PRINT @ 128 + 11 ,' NOUGHTS
   4 PRINT @ 192 + 13 ,' AND
   6 PRINT @ 256 + 11 ,"CROSSES
   8 FOR Z = 1 TO 1300 NEXT Z
  10 CLS
  20 PMODE 3,1 SCREEN 1,0 PCLS
  30 LINE (110,20) - (110 140) PSET
  40 LINE (150,20) - (150,140),PSET
  50 LINE (70,60) - (190 60),PSET
  60 LINE (70,100) - (190 100),PSET
  70 A$ = INKEY$
  80 IF A$ = 'x THEN GOSUB 500,
  90 IF A$ = 'o THEN GOSUB 700
 100 GOTO 70
 500 B$ = INKEY$
 510 IF B$ = ' 1 THEN GOSUB 2000
 520 IF B$ = 2 THEN GOSUB 2050,
 530 IF B$ = 3' THEN GOSUB 2100,
 540 IF B$ = '4 THEN GOSUB 2150,
 550 IF B$ = "5 THEN GOSUB 2200,
 560 IF B$ = ' 6' THEN GOSUB 2250
 570 IF B$ = ' 7 THEN GOSUB 2300
 580 IF B$ = "8 ' THEN GOSUB 2350
 590 IF B$ = '9 ' THEN GOSUB 2400
 600 GOTO 500
 700 C$ = INKEY$
 710 IF C$ = ' 1 THEN GOSUB 3000
 720 IF C$ = '2 THEN GOSUB 3050,
 730 IF C$ = '3' THEN GOSUB 3100,
 740 IF B$ = '4 THEN GOSUB 3150
 750 IF B$ = '5 THEN GOSUB 3200
 760 IF B$ = "6' THEN GOSUB 3250
 770 IF B$ = "7' THEN GOSUB 3300,
 780 IF B$ = "8' THEN GOSUB 3350
 790 IF B$ = ' 9 THEN GOSUB 3400,
 800 GOTO 700
2000 LINE (80,30) - (100 50) PSET
2010 LINE (100,30) - (80,50),PSET
2020 GOTO 70
2050 LINE (120,30) - (140,50),PSET
2060 LINE (140,30) - (120,50),PSET
2070 GOTO 70
2100 LINE (160,30) - (180 50),PSET
2110 LINE (180 30) - (160,50) PSET
2120 GOTO 70
2150 LINE (80,70) - (100 90),PSET
2160 LINE (100,70) - (80 90) PSET
2170 GOTO 70
2200 LINE (120,70) - (140 90),PSET
2210 LINE (140,70) - (120,90),PSET
2220 GOTO 70
2250 LINE (160 70) - (180,90),PSET
2260 LINE (180 70) - (160,90) PSET
2270 GOTO 70
2300 LINE (80 110) - (100,130) PSET
2310 LINE (100 110) - (80,130),PSET
2320 GOTO 70
2350 LINE (120,110) - (140 130),PSET
2360 LINE (140 110) - (120,130),PSET
2370 GOTO 70
2400 LINE (160,110) - (180,130) PSET
2410 LINE (180 110) - (160 130) PSET
2420 GOTO 70
3000 LINE (80,30) - (100,50) PSET,B
3010 GOTO 70
3050 LINE (120 30) - (140 50),PSET,B
3060 GOTO 70
3100 LINE (160,130) - (180,50),PSET B
3110 GOTO 70
3150 LINE (80,70) - (100,90),PSET B
3160 GOTO 70
3200 LINE (120 70) - (140,90),PSET B
3210 GOTO 70
3250 LINE (160,70) - (180 90),PSET,B
3260 GOTO 70
3300 LINE (80,110) - (100 130),PSET,B
3310 GOTO 70
3350 LINE (120,110) - (140,130) PSET B
3360 GOTO 70
3400 LINE (160,110) - (180 130),
     PSET,B
3410 GOTO 70
```

Dragon 32 Users Club

Free Membership!

Why Not Join Now And Receive:

- A FREE TOOL BOX CASSETTE FOR YOUR DRAGON TIPS
- A CHANCE TO BUY OUR TAPE OF THE MONTH AT A DISCOUNT PRICE
- THE WIDEST SELECTION OF SOFTWARE FOR YOUR DRAGON AT COMPETITIVE PRICES
- AN ASSURED 48-HOUR MAIL ORDER SERVICE
- DETAILS OF THE UK'S FIRST CASSETTE BASED MAGAZINE

JOIN NOW ENCLOSING YOUR NAME AND ADDRESS TO

DRAGDN 32
USERS CLUB
31 North Street
Wereham
Dorset BH20 1AD

GAMES AND COMPUTERS

M & J SOFTWARE

DRAGON COMPANION BOOK — £4 95

Study the working of BASIC with the disassembler
Discover seven extra graphics modes
Take complete control of video memory mapping
Increase the processor speed (not a hardware mod)
Append programs from tape
Incorporate useful routines from BASIC in your machine programs
Add commands to BASIC

DRAGON IMPLEMENTATION OF FORTH — £15 00

This is a cassette based implementation and is fully documented

FORTH LISTINGS — £7 00

6502 8080 Z80 6809 6800 1802 8088/8086 68000 PDP 11 in stock

INSTALLATION MANUAL — £5 00

Necessary for implementing FORTH and its editor

All prices inclusive of postage and packing
Cheques and POs made payable please to

M & J SOFTWARE
54 Grays Close, Scholar Green Stoke-on-Trent ST7 3LU
Tel (0782) 517679

Computasolve Ltd.
8 Central Parade, St Mark's Hill
Surbiton

Telephone 01-390 5135 Opening hours: 9 30—6 30 Mon—Sat

Dragons from stock	£199 99
Dragon joysticks	£19 95
Telewriter word processor for the Dragon	£49 95
STA510 matrix printer	£399 00
Seikoshe GP100A matrix printer	£240 00

A large selection of Microdeal software in stock such as Donkey King, Planet Invasion, Storm, Invaders Revenge, Katerpillar Attack and many more
Plus Bugbyte software
All prices including VAT

ABACUS ADVENTURE ABACUS BUSINESS ABACUS UTILITY ABACUS EDUCATIONAL ABACUS GAMES PACK

NEW

Computer Programing for Business and Pleasure

21 UNION STREET
RAMSBOTTOM LANCS
Tel Bolton 52726 \ 383839

NEW*NEW*NEW
Excellent Value 8 GAME PACKS
Each pack contains a selection of games. Adventure, Educational, and just good Fun. Utilizing the Dragons superb Graphics, Colour, Sound.

£6·50 PACK

GAME PACK 1
1 [illegible]
2 MUNCHER
3 HUNTER
4 [illegible]
5 MAZE & CROSSES
6 [illegible]
7 [illegible]
8 [illegible] THE VALLEY

GAME PACK 2
1 [illegible] BASE
2 BATTLESHIPS
3 [illegible]
4 [illegible]
5 [illegible] BOMBER
6 [illegible]
7 HAUNTED PARK
8 HANGMAN ANAGRAM

GAME PACK 3
1 [illegible]
2 [illegible]
3 BLIND MAZE
4 ONE MAN & HIS DOG
5 LIFE
6 KNIGHT'S TOUR
7 [illegible] PATROL
8 [illegible]

ADVENTURE

DEVILS TRIANGLE
[illegible] treasures [illegible] DEVILS TRIANGLE [illegible] Bermuda [illegible]
£5 00

EARTH RESCUE
[illegible]

PENDRAGON SPACE TRADER
[illegible]

BUSINESS

Stock Control
[illegible]

Payroll
[illegible]

Mailing List
[illegible]

Tax Calculator
[illegible]

UTILITY

GRAPHITSET
[illegible]

[illegible] DUMP
[illegible]
£5 95

EDUCATIONAL

METRI TUTOR
[illegible]

WANTED URGENTLY
We require high quality Dragon software [illegible] royalties paid
Send your software today for fast evaluation

GENEROUS DEALERS DISCOUNT AVAILABLE

ABACUS SOFTWARE

FIRST TIME ADVERTISED
IN STOCK NOW

- Lazer Cycles
- Mission Dru
- Hangman
- Breakout

All on one cassette only £6.95 including p&p

Test your skill
Challenge your friends
Orders sent by return of post

Lasersound Software Ltd
Unit DD4
Stretford Workshops
Burford Road
London E15

Telephone 01-519 0791
01-519 7809

DEALER/EXPORT ENQUIRIES WELCOME

PROGRAMS WANTED — 30% OR CASH

Dragon Answers

If you ve got a technical question or problem write to Cathy Hyde. Dragon Answers *Dragon User* Hobhouse Court 19 Whitcomb Street, London WC2 7HF

No joy on joysticks

I HAVE a Dragon 32 and on page 88 89 and 90 of the manual there is a game using joysticks It is supposed to be a battle between two ships in space It uses the joystick to move your craft and the fire button to operate your weapon to hit the other ship But when I press the fire button on the left joystick the right joystick s ship fires at me and vice versa I think that the trouble is in lines 140 150 and 160 If it s possible can you find out it there s an error anywhere

John Winter (Age 12)
Aylesbury
Bucks

IT APPEARS THAT you have an earlier edition of the manual with a misprint on the joystick commands The joysticks are actually reversed from those given le JOYSTK (0) and (1) refer to right joystick and JOYSTK (2) and (3) to the left joystick The simplest method of altering the program on page 88 is to reverse the scores and fire buttons Amend lines 120 150 and 160 as below

```
120 CLS0  FOR Y=0 TO 1
    PRINT @0,Z(1) PRINT @
    26 Z (0)
150 IF P = 125 OR P = 253
    THEN F = 1 T-0 GOSUB
    200
160 IF P = 128 OR P = 254
    THEN F - 0 T = 1 GOSUB
    200
```

SAM explained

I WONDER it you could answer the following queries I have on computers and programming

1) What is SAM?
2) Is there any way which I could write a program that can totally ignore commands like list and break?
3) Is it possible to damage the computer by POKING a wrong number?

P Ranson
Great Moor
Stockport

THE SAM IS a Synchronous Address Multiplexer which controls the way in which the memory works It is programmed to work in conjunction with the Video Display Generator to control PMODES and also works in conjunction with the processor to update the RAM

There is no simple way to write a program which ignores commands such as LIST and BREAK You would need a good knowledge of machine code and the Basic interpreter in order to do this

Temporary crashing can be brought about by POKING to the wrong number especially in the area of the SAM chip but no permanent damage should be done

Call for software

MY SON has had a Dragon 32 for several months now but is still very disappointed at the quality of software printed in computer magazines A friend managed to get hold of a magazine called the *Rainbow* I would like to know if you could supply me with the name and address of the distributors in this country

M A Connolly
Bewdley
Worcs

THE MAGAZINE *RAINBOW* is available in this country from Elkan Electronics 28 Bury New Road Prestwich Manchester Tel 061 773 3985

Programs disappear

COULD YOU please explain to me why errors start to appear and whole lines — even programs — start to disappear on my Dragon after a while in the higher resolutions especially re running a particular program? I have noticed that many of such disappearing programs do not contain PCLEAR or CLEAR statements but I m not sure whether this is important Is my Dragon faulty or am I one of many with the same problem?

Dennis Lawrence
South Woodford
London

WE ARE AT PRESENT looking into the type of problem you have encountered Transients in the domestic power supply may cause loss of programs and corruption as described If this is the case then pressing RESET or switching the machine off then on again usually clears the problem However it may be worth while returning your machine to the original dealer for testing as you may have a fault on the Dragon itself

Skipping data

MY DRAGON 32 will not accept a very long supposedly Microsoft compatible program Sea Battle taken from Creative Computing s More Basic Computer Games Data statements appear in a number of places and these are implemented by the use of RESTORE followed by the line number of the data statement as required The Dragon gives me a syntax error at each RESTORE

Preliminary instructions acknowledge possible difficulty and advise Improvise by Using a Restore and FOR NEXT with Read statements to skip over the data that should be ignored I do not understand this advice — can you assist me please?

W A Coysh
Southwick
Brighton

RESTORE IS USED to got to the beginning of the data and once used the only way to get to any particular bit of data is by reading through all data before it For example to get to the fifth bit of data use RESTORE followed by FOR I = 1 TO 5 READ AS NEXT This will read the first five values into AS successively, and leave the fifth one there

Crashing at speed

ON MORE than one occasion your magazine has printed information that the speed of the Dragon 32 can be increased by POKE 65495 0 On my machine this always causes an immediate program crash it is necessary to switch off to regain control What am I doing wrong?

B Hayton
Willaston
South Wirral

THE DRAGON 32 HAS been designed to work at a certain speed and the POKE mentioned causes it to run at double speed Therefore it is working out of the original design specifications and may crash We do not recommend the use of this POKE for the above reasons

Solution is a loop

I HAVE got a Dragon 32 and for the past few weeks have been trying to write a certain program It involves the user putting in a number say five The computer then adds five + four + three + two + one If the number was 10 the computer would add 10 + 9 + 8 etc I haven t had any success in writing the program and hope you can help me out

Chris Dunne
Morden
Surrey

THE TYPE OF PROGRAM you require is made relatively simple using the FOR NEXT loop

```
10 ANSWER = 0  N = 0  A =
   0
20 CLS
30 INPUT 'NUMBER' ,N
40 IF N>0 THEN 50 ELSE 10
50 FOR A = 1 TO N
60 ANSWER = ANSWER + A
70 NEXT A
80 PRINT ANSWER
90 IF INKEY$ = '' THEN 90
   ELSE 10
```

Competition Corner

Send your answers to Competition Corner *Dragon User* Hobhouse Court, London WC2 7HF

Win a printer

ONE OF THE advantages of a computer is its unflagging ability to carry out its tasks Even when it is running a complex program say high level chess the computer is always ready and willing for another game Similarly its capability of repeatedly carrying out simple claculations hundreds or thousands of times is far superior to when the task is performed by a human operator where fatigue and distraction could lead to errors No matter how late the hour the computer is or should be as bright as a button — or at least as bright as the VDU!

As an example of using the computer to run a program involving hundreds of individual calculations let's consider some mathematical series A series is a set of numbers each of which bears a relationship to the preceding terms Take this simple progression

$1/1 - 1/2 + 1/3 - 1/4 + 1/5 - 1/6 +$

This can be easily translated into a simple program and if the program is run and the cumulative total displayed as each successive term is added it can be seen to be converging towards a specific value As the series progresses the total stabilises towards 0 693147 the natural logarithm of 2 This is one of the ways in which this value can be evaluated empirically

Other mathematical constants can be similarly found The series $1 + 1/1! + 1/2! + 1/3! + 1/4! + 1/5! +$ converges on 2 718281828 the mathematical constant e The exclamation marks are factorial signs For example 4! or factorial 4 equals $4 * 3 * 2 * 1$

That enigmatic constant pi despite its irrational value can be evaluated by means of a series Here are just two series which produce pi

SERIES (1)

$2 * (2/1 * 2/3 * 4/3 * 4/5 * 6/5 * 6/7 * 8/7 * 8/9 \quad)$

Note that the numerator and denominator increase by two but on alternate steps

SERIES (2)

$4 * (1/1 - 1/3 + 1/5 - 1/7 + 1/9 - \quad)$

It seems incredible that so simple a series as this can produce so complex a value as pi

The series that we have considered so far are *convergent* — that is they converge to a definite value Another type of series is called divergent — and these increase without limit For instance the series

$1 + 2 + 3 + 4 + 5 + 6 + 7 +$

will do this increasing to infinity — or in the case of a computer until the mathematical capacity of the machine is exceeded Obviously if each successive term gets larger then the series is divergent Does this mean that if successive terms get smaller the series will converge to a finite value? Not necessarily — consider the following

$1 + 1/2 + 1/3 + 1/4 + 1/5 + 1/6 + 1/7 + 1/8 +$

Here although each term gets smaller the series does in fact, diverge This can be seen readily if we break the series up into sections The two terms $1/3 + 1/4$ sum to more than $1/4 + 1/4$ Therefore these two terms are greater than 1/2

Similarly the next four terms $1/5 + 1/6 + 1/7 + 1/8$ are greater than $1/8 + 1/8 + 1/8 + 1/8$ This group is therefore also greater than 1/2 as is the next group of eight terms the next group of sixteen terms and so on We can now see that our final total must be greater than

$1 + 1/2 + 1/2 + 1/2 + 1/2 + 1/2 +$

Thus it will diverge to infinity although it will do so very slowly

The rate of divergence of the series $1 + 1/2 + 1/3 + 1/4 + 1/5 + 1/6 + 1/7 + 1/8 +$ forms the basis of this month's competition

It can be seen that the total sum exceeds 2 when the fourth term is added $(1 + 1/2 + 1/3 + 1/4)$ In order to exceed 3 the series has to be extended to include the eleventh term

How many terms need to be added for the total to exceed each integer up to 10?

Prizes

THE PRIZE FOR this month's competition is donated by the software house Microdeal The package offered is one Epson MX80F/T III dot matrix printer for your Dragon, a word processing package and the full range of software from Microdeal

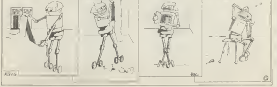
Rules

TO WIN THE software and printer all you have to do is send in the most elegant solution to the puzzle You must show how the puzzle can be solved with the use of a Basic program, developed on your Dragon 32 computer

As a tiebreaker complete the sentence below in 10 words or less

I will use my Dragon 32 as a word processor because

Your entry must arrive at *Dragon User* by the last working day in May 1983 The name of the winner and the solution to the puzzle submitted by the winner will be printed in the July issue of *Dragon User* You may only enter the competition once Entries will not be acknowledged and we cannot enter into correspondence on the result



Pirate

(DRAGON 32)

Fast thinking — that's the name of the game!

You are the Captain of a Galleon whose brief is to free the seas from Pirates

You can manoeuvre north, south, east,or west up to 4 leagues at a time as you roam the oceans Replenishment of crew members,food etc. can only come from harbours

Navigate to avoid collisions with Islands or Pirates and don't fall off the edge of the world

Take care of your stock of guns, cannonballs, sails and men in this action packed high seas adventure with its ingeneous High-Res Graphics

Please Send

PIRATE £8 50 ☐

I enclose CHEQUE/P O for £

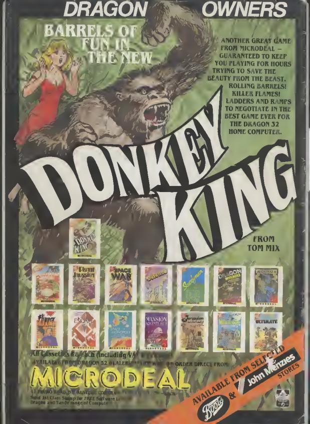
Please Debit Access Card No ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Name

Address

Post Code

ABRASCO LTD 28 THE FAIRWAY SOUTH RUISLIP MIDDLESEX HA4 0RY TEL 01 845 0187


DONKEY KING
PLANET INVASION
SPACE WAR
DRAGON INVADERS
ALCATRAZ II
SPACE MONOPOLY
MANSION ADVENTURE I
ULTIMATE
MICRODEAL

DRAGON OWNERS

BARRELS OF FUN IN THE NEW

ANOTHER GREAT GAME FROM MICRODEAL — GUARANTEED TO KEEP YOU PLAYING FOR HOURS TRYING TO SAVE THE BEAUTY FROM THE BEAST. ROLLING BARRELS! KILLER FLAMES! LADDERS AND RAMPS TO NEGOTIATE IN THE BEST GAME EVER FOR THE DRAGON 32 HOME COMPUTER.

DONKEY KING

FROM TOM MIX

All Cassettes £8 each (including VAT [illegible])

AVAILABLE FROM DRAGON 32 DEALERS [illegible] OR ORDER DIRECT FROM:

MICRODEAL

41 TRURO ROAD, ST. AUSTELL, CORNWALL [illegible]

Send 1st Class Stamp for FREE Software Li
Dragon and Tandy range of Compute

AVAILABLE FROM SELECTED Boots & John Menzies STORES